347

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Airline	GRX4020A, GRX4120A Tel. Rec.	347-1
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Traveler. 621-740-U chassis. 632-26,
621-750, U- 632-26,
721-R400-U.

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

AIRLINE MODELS GRX4020A, GRX4120A

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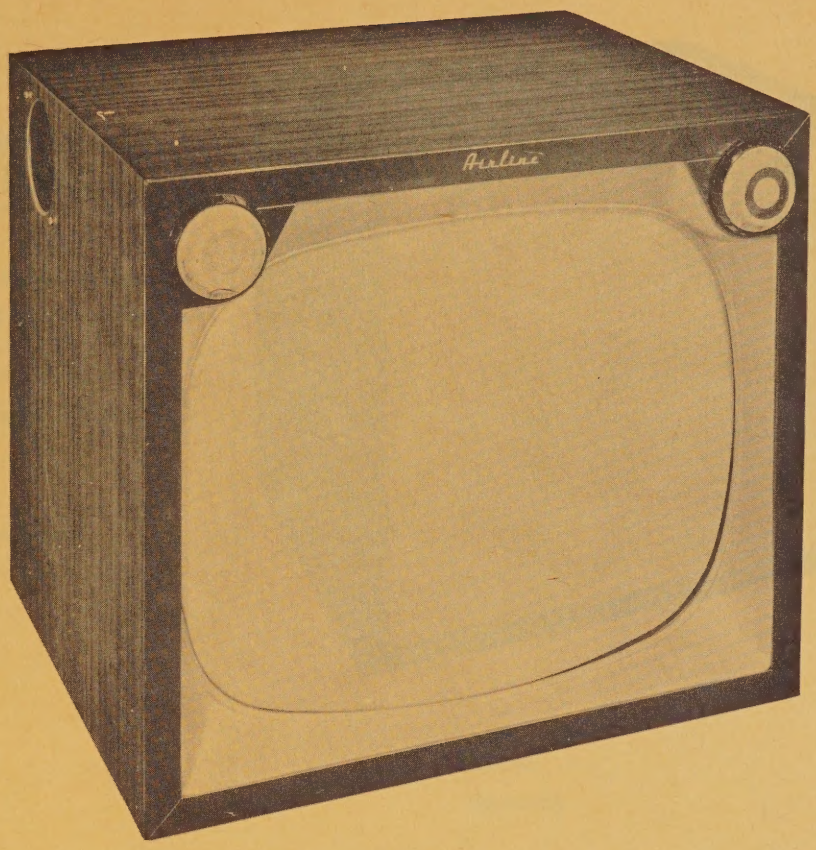

AIRLINE MODEL GRX4020A

TRADE NAME	Airline Models GRX4020A, GRX4120A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Twelve
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING 1.14 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13VHF, 14 thru 83UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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AIRLINE MODELS GRX4020A, GRX4120A

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DATE 2-57 SET 347 FOLDER 1

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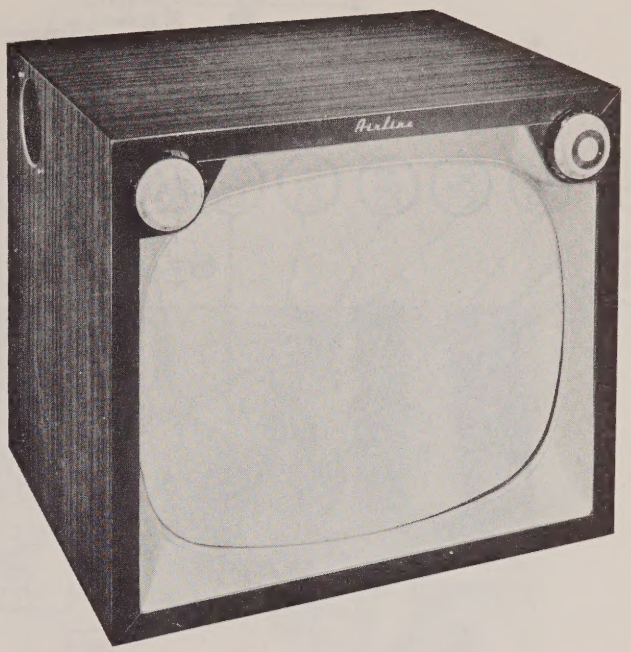
AIRLINE MODELS GRX4020A, GRX4120A

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from front.
2. Remove 2 metal screws holding volume control to cabinet.
3. Remove 12 wood screws, remove rear cover.
4. Remove 7 wood screws from bottom of cabinet.
5. Remove speaker leads.
6. Remove chassis.
7. Remove 2 speaker nuts, remove speaker.



MODEL

GRX4020A

AIRLINE MODELS
GRX4020A, GRX4120A

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of VHF tuner oscillator, it is necessary to remove the chassis from the cabinet. (See Disassembly Instructions.)

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety Glass cleaning, it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The horizontal frequency slug is located on the rear of the set and is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally.

FUSES

A 5.5Ω fusible resistor (R70) is used for LV power supply protection.

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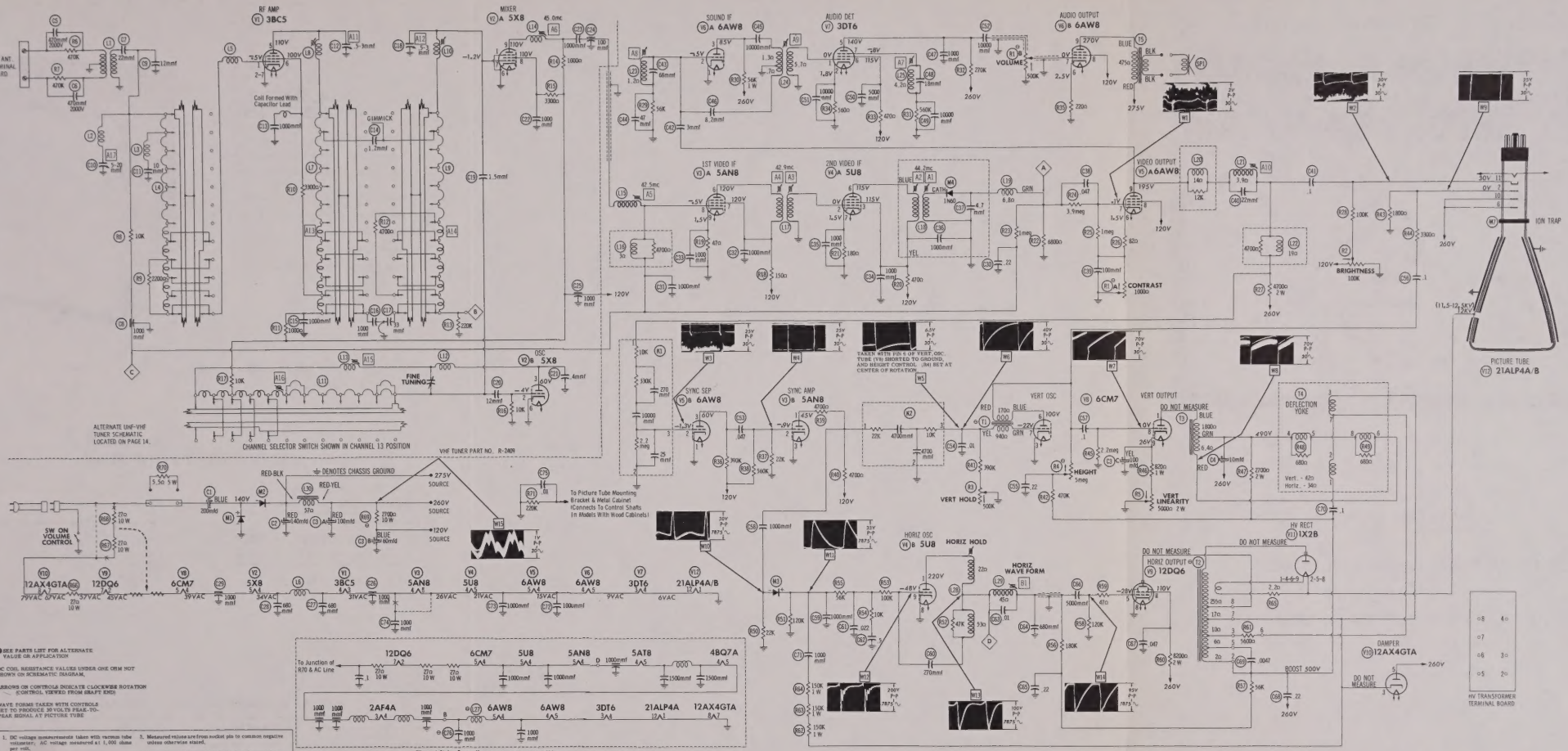
DATE 2-57 SET 347 FOLDER 1



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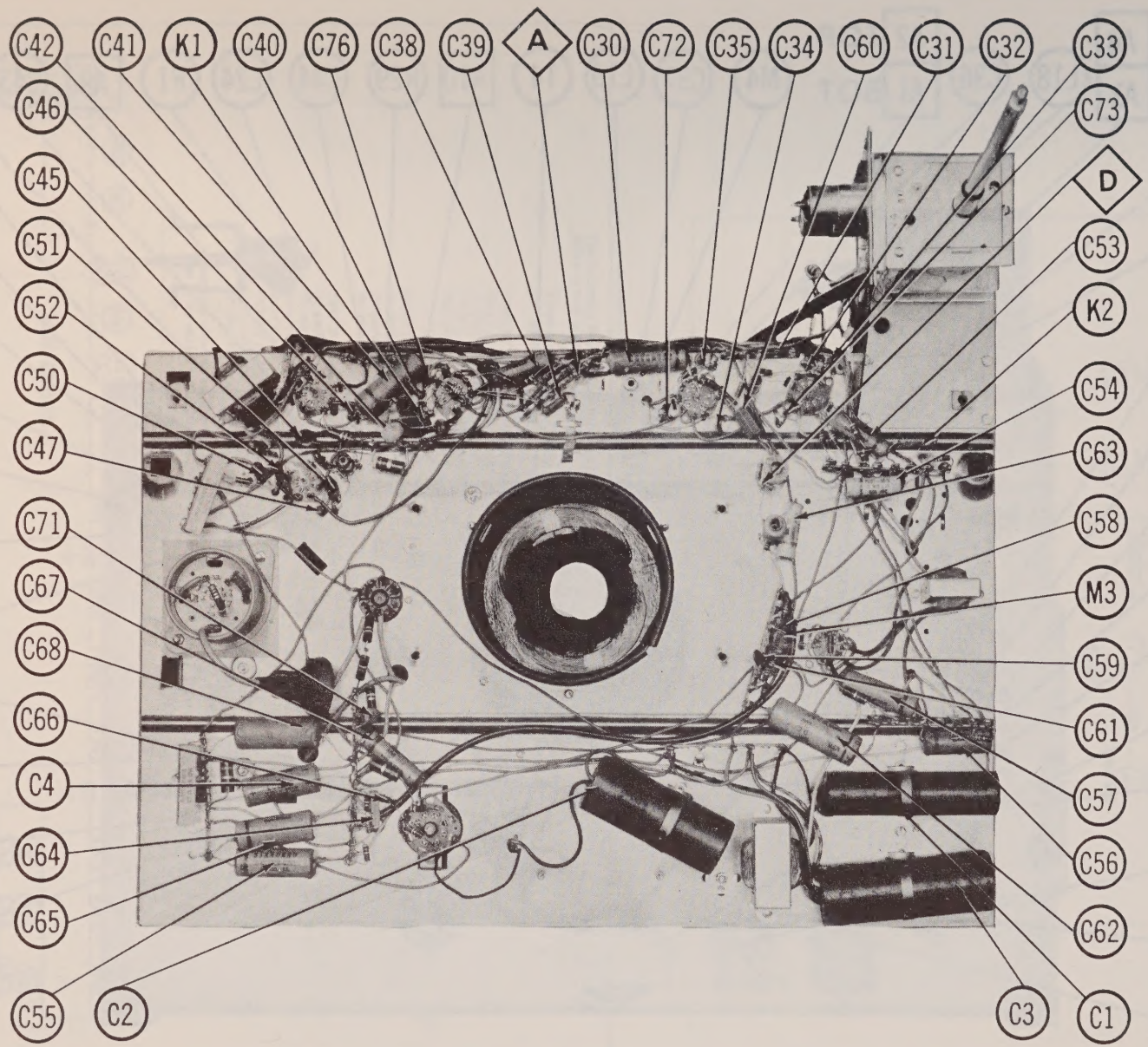
GRX4020A, GRX4120A



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

AIRLINE MODELS
GRX4020A, GRX4120A

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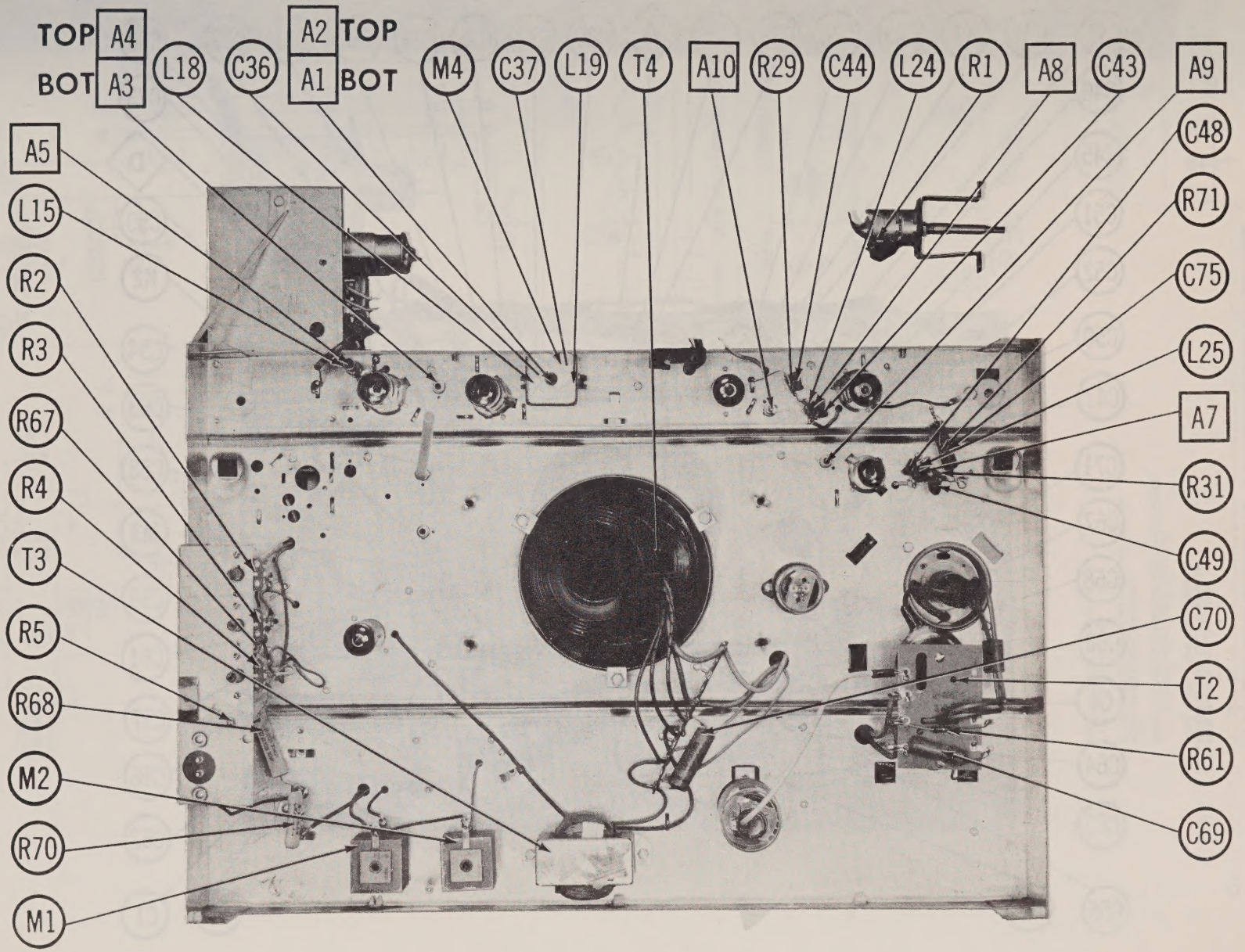
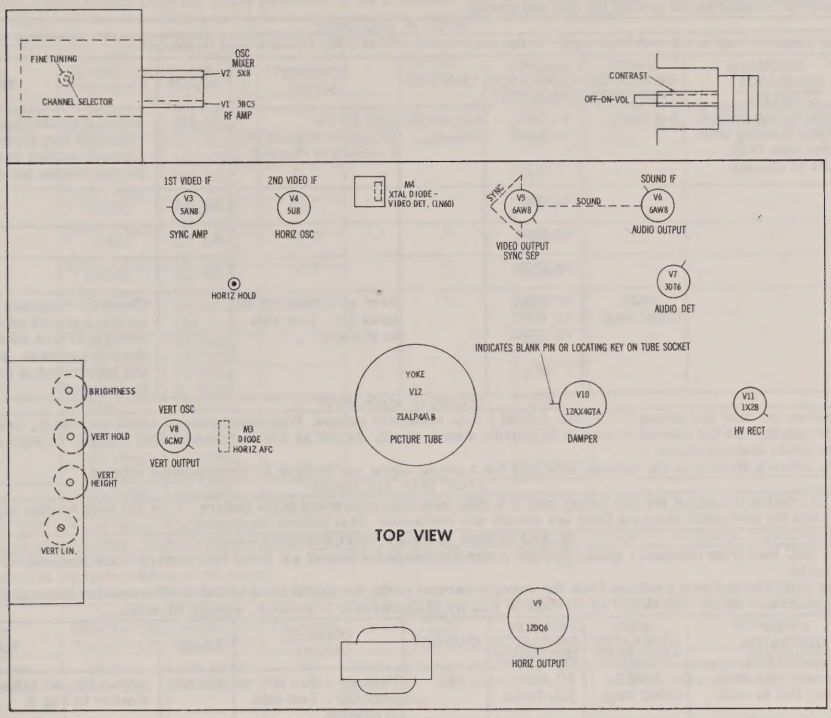


CHASSIS TOP VIEW

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

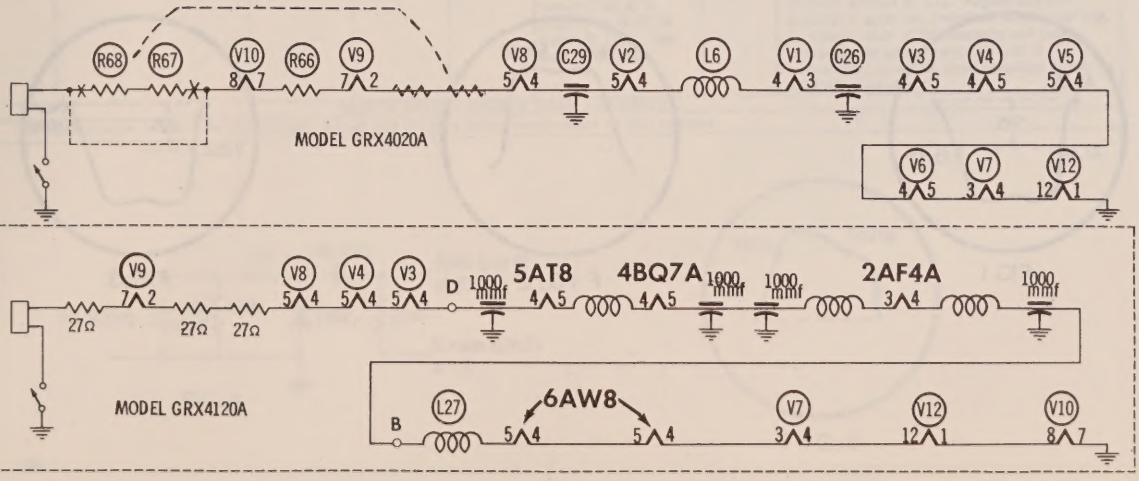
POWER SUPPLY FAILURE
No raster, no sound - Fusible Resistor (R70), Rectifiers (M1, M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, Diode (M4), V5, V12
No pic, no sound, has snow - V1, V2
No pic, has sound, has raster - V5, V12
Has pic, no sound - V6, V7

SYNC FAILURE
No vert. sync - V5, V3, V8
No horiz. sync - V5, V3, Diode (M3), V4
No vert. or horiz. sync - V5, V3

SWEEP FAILURE
No raster, has sound - V4, V9, V10, V11
No vertical deflection - V8
Poor vert. linearity or foldover - V8
Poor horiz. linearity or foldover - V4, V9, V10
Narrow picture - V4, V9, V10, M1, M2
Vert. off freq. - V5, V3, V8
Horiz. off freq. - V5, V3, M3, V4

Since this receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below).



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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS--READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to the ungrounded side of C30. Positive lead to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over converter tube (V2). Low side to chassis.	Not Used.	44.2MC (unmod)	Any unused channel.	USE VTVM DC probe to point (A). Common to chassis.	A1, A2	Adjust for maximum deflection. Tune for peak with slug farthest apart. Use only enough sweep generator output to provide usable indication on VTVM.
2.	"	"	"	42.9MC	"	"	A3, A4	"
3.	"	"	"	42.5MC	"	"	A5	"
4.	"	"	"	45.0MC	"	"	A6	"
5.	"	"	44MC (10MC Swp)	41.25MC 42.6MC 45.75MC	"	Vert. amp. thru 10K to point (A). Low side to chassis.		Check for response similar to Fig. 1 with markers placed as indicated. If necessary, retouch A1 thru A6 SLIGHTLY to obtain desired response. More than 1 full turn on any adjustment in either direction should not be required.

SOUND IF ALIGNMENT

Turn the set on and tune in a strong TV signal. Adjust A7 for maximum volume. Disconnect antenna and if necessary, use an attenuator between the antenna and the antenna terminals to provide a weak signal. Adjust A8 and A9 for maximum volume. (A weak signal is necessary to make the peaks distinguishable.)
Connect the antenna directly to the antenna terminals for a strong signal and retouch A7 for maximum volume.

4.5MC TRAP ALIGNMENT

Tune in a TV station and adjust the fine tuning until a 4.5MC beat pattern appears in the picture. Turn A10 fully counter clockwise, then clockwise until the horizontal scanning lines are smooth and continuous (beat pattern disappears).

RF AND MIXER ALIGNMENT FOR TUNER #R-2409

Disconnect AGC lead from terminal 1 (point (C)) and connect the negative lead of a 1.5 volt bias battery to the terminal. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru 10K to point (B). Low side to chassis.	A11, A12	Adjust A11 and A12 for maximum response similar to Fig. 2.
7.	"	"	177MC (10MC Swp)	175.25MC 179.75MC	7	"		Check for response curve similar to Fig. 2. SLIGHTLY retouch A11 and A12 for desired response. Recheck step 6 and adjust A11 and A12 for best compromise, if necessary.
8.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A13, A14	Check for response similar to Fig. 2. If necessary, remove cover and adjust A13 and A14 to obtain desired response. Adjust by expanding or compressing coil turns. Replace cover and recheck response curve,
9.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"		Check for response curve similar to Fig. 2. SLIGHTLY retouch A13 and A14 for desired response, if necessary. Recheck step 8 and adjust A13 and A14 for best compromise.

OSCILLATOR ALIGNMENT FOR TUNER #R-2409

Leave bias connected as under "RF and Mixer Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω carbon resistors.	Across the antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru 10K to point (A). Low side to chassis.	A15	Adjust to place sound marker in trap notch as in Fig. 2. Video marker should fall at 50%.
11.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A16	"

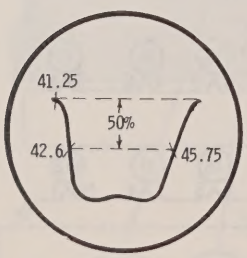


FIG. 1

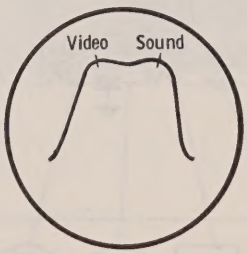


FIG. 2

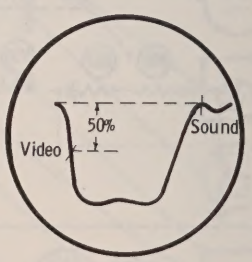


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT FOR TUNER #R-2451

Connect the negative lead of a 3 volt bias supply to point Ⓒ. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω carbon resistors.	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 47K to point Ⓐ. Low side to chassis.	A18	Adjust to place sound marker in trap notch as in Fig. 3. Video marker should fall at 50%.
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A19	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A20	
			195MC (10MC Swp)	193. 25MC 197. 75MC	10		A21	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A22	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A23	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A24	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A25	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A26	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A27	
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A28	
			57MC (10MC Swp)	55. 25MC 59. 75MC	2		A29	

VHF RF AND MIXER ALIGNMENT

Connect bias as under "VHF RF and Mixer Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω carbon resistors.	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205. 25MC 209. 75MC	12	Vert. amp. thru 10K to point Ⓔ. Low side to chassis.	A30, A31, A32	Adjust for response curve similar to Fig. 2 with markers above 90%.
14.	"	"	213MC (10MC Swp)	211. 25MC 215. 75MC	13	"		Check for response similar to Fig. 2. If markers fall below 70% on any channel, make compromise adjustments of A30, A31 and A32 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199. 25MC 203. 75MC	11			
			195MC (10MC Swp)	193. 25MC 197. 75MC	10			
			189MC (10MC Swp)	187. 25MC 191. 75MC	9			
			183MC (10MC Swp)	181. 25MC 185. 75MC	8			
			177MC (10MC Swp)	175. 25MC 179. 75MC	7			
			85MC (10MC Swp)	83. 25MC 87. 75MC	6			
			79MC (10MC Swp)	77. 25MC 81. 75MC	5			
			69MC (10MC Swp)	67. 25MC 71. 75MC	4			
			63MC (10MC Swp)	61. 25MC 65. 75MC	3			
			57MC (10MC Swp)	55. 25MC 59. 75MC	2			

UHF TUNER ALIGNMENT

Connect the negative lead of a 3 volt bias supply to the ungrounded side of C30. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω carbon resistors.	Across UHF antenna with 120Ω in each lead.	803MC (20MC Swp)	801. 25MC 805. 75MC	69	Vert. amp. thru 10K to point Ⓕ. Low side to chassis.	Fine tuning.	Adjust fine tuning to place markers within 30% of peak response.
16.	"	"	"	"	"	Vert. amp. thru detector (Fig. 4) to place (Pin 6) of 1st Video IF (V3). Low side to chassis.	A33	Remove tuner shield and channel 9 strip to provide access to A33. Adjust A33 for maximum gain and response similar to Fig. 5. Check other UHF channels and make compromise adjustments on A33 if necessary, to obtain best response curve on all UHF channels.

41MC IF INTERFERENCE TRAP ALIGNMENT

If interference is noted on any channel, adjust A17 for MINIMUM interference on that channel.

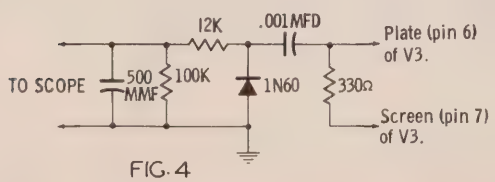


FIG. 4

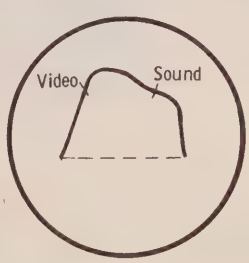
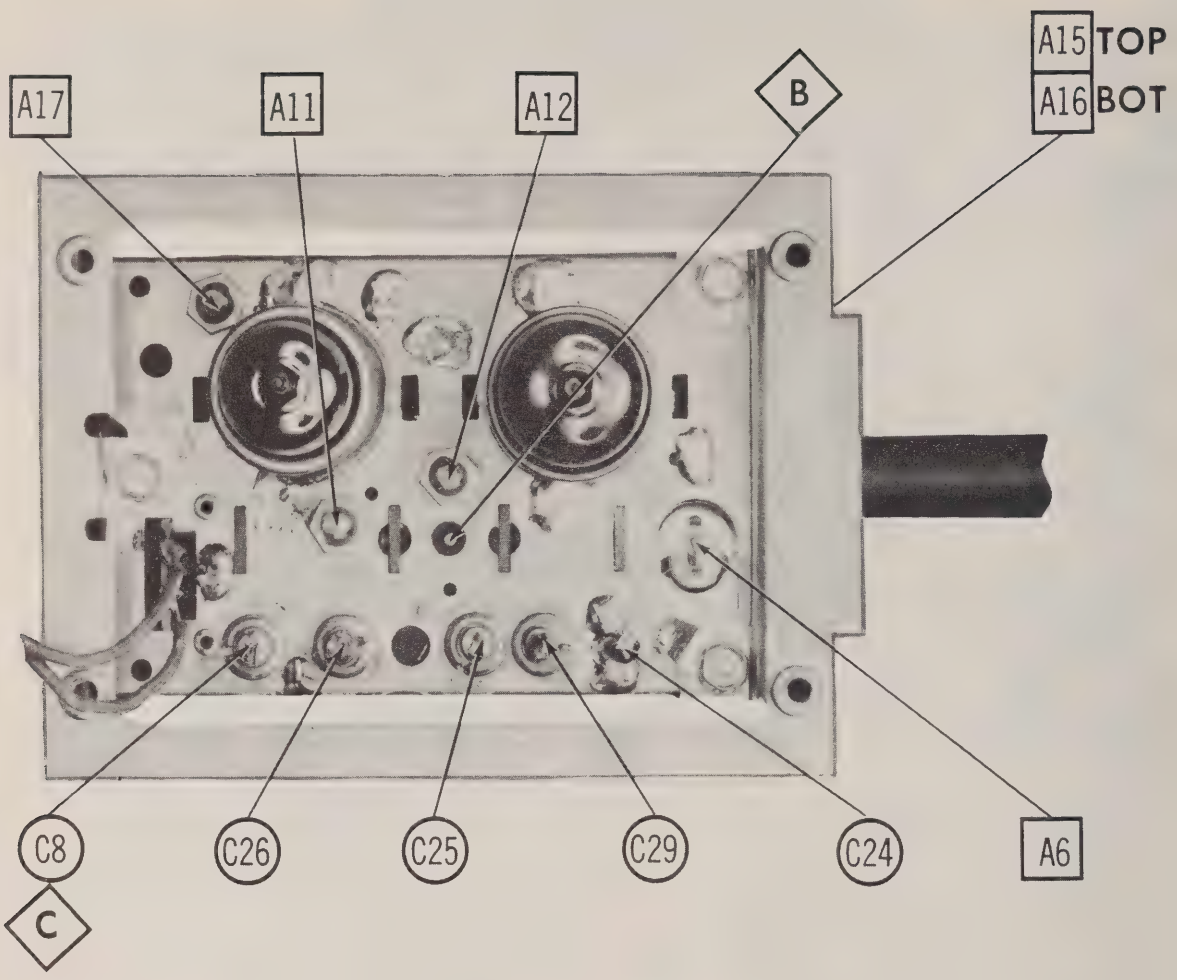
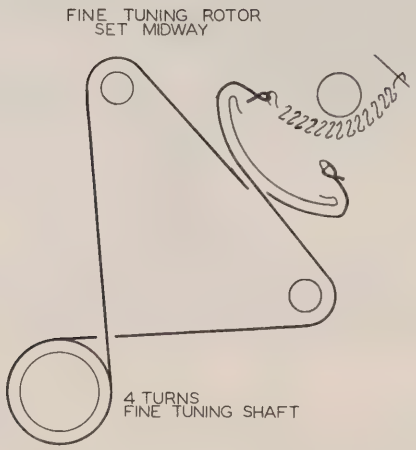


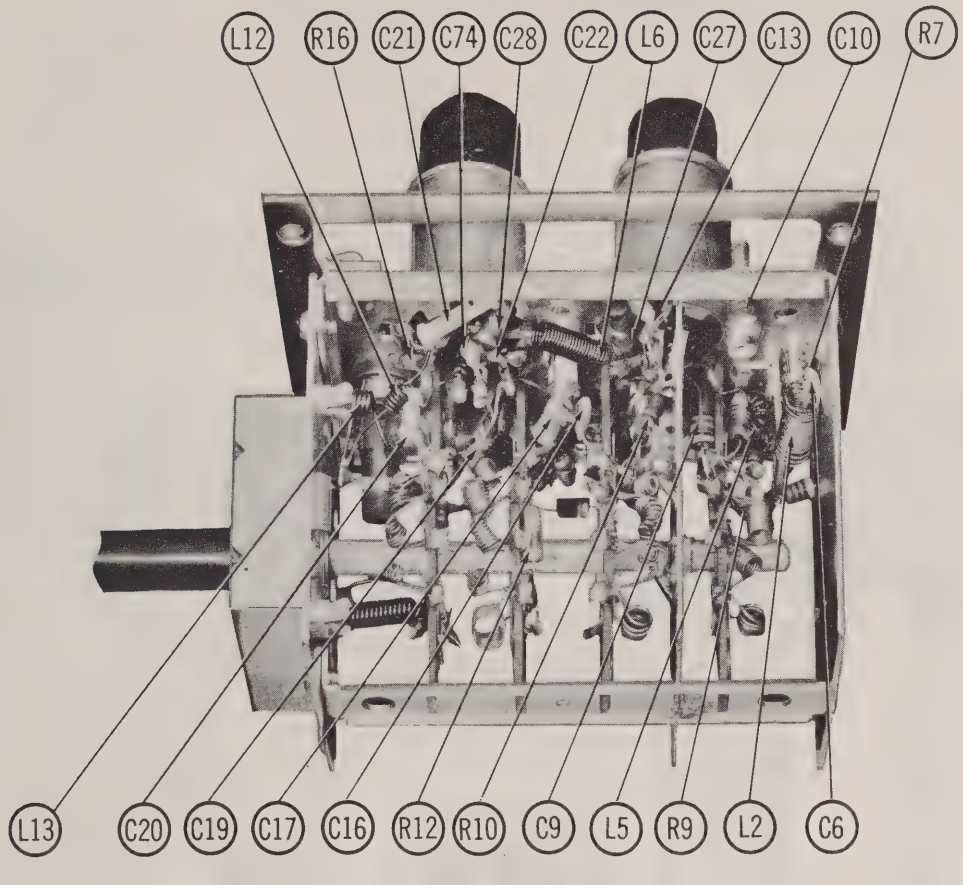
FIG. 5



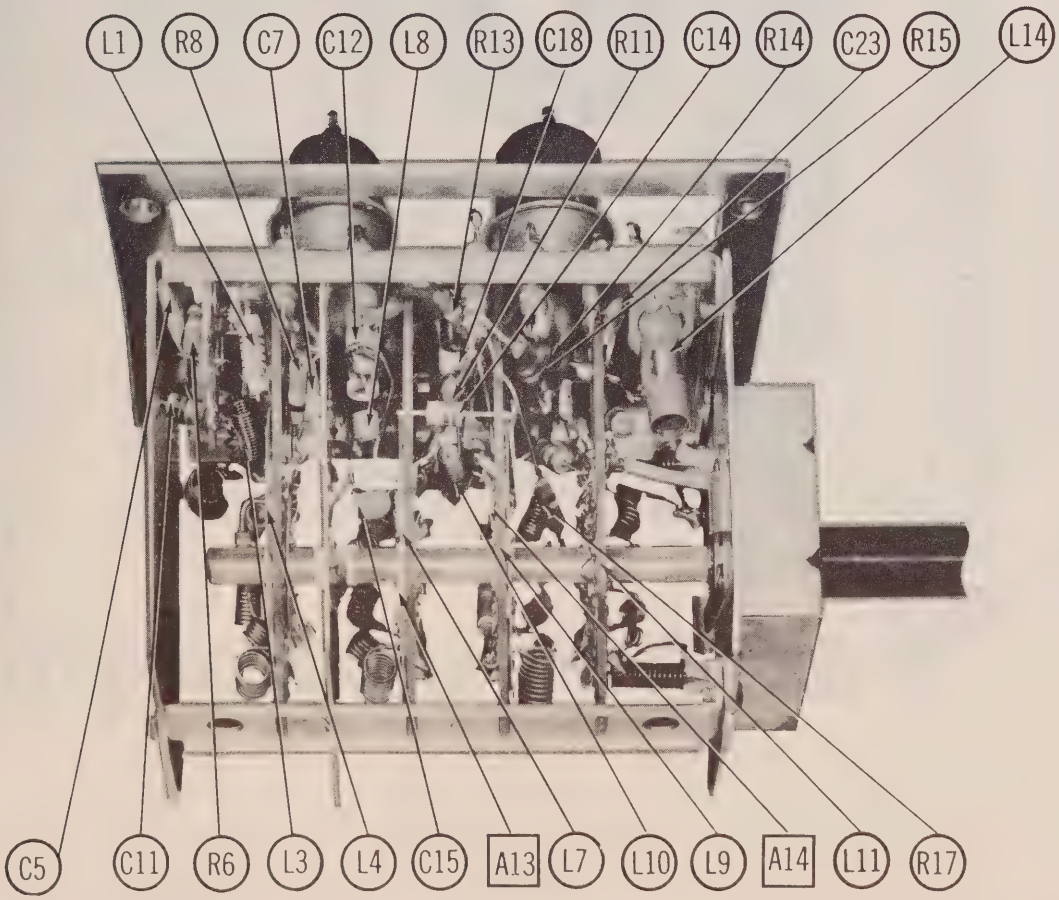
RF TUNER TOP VIEW



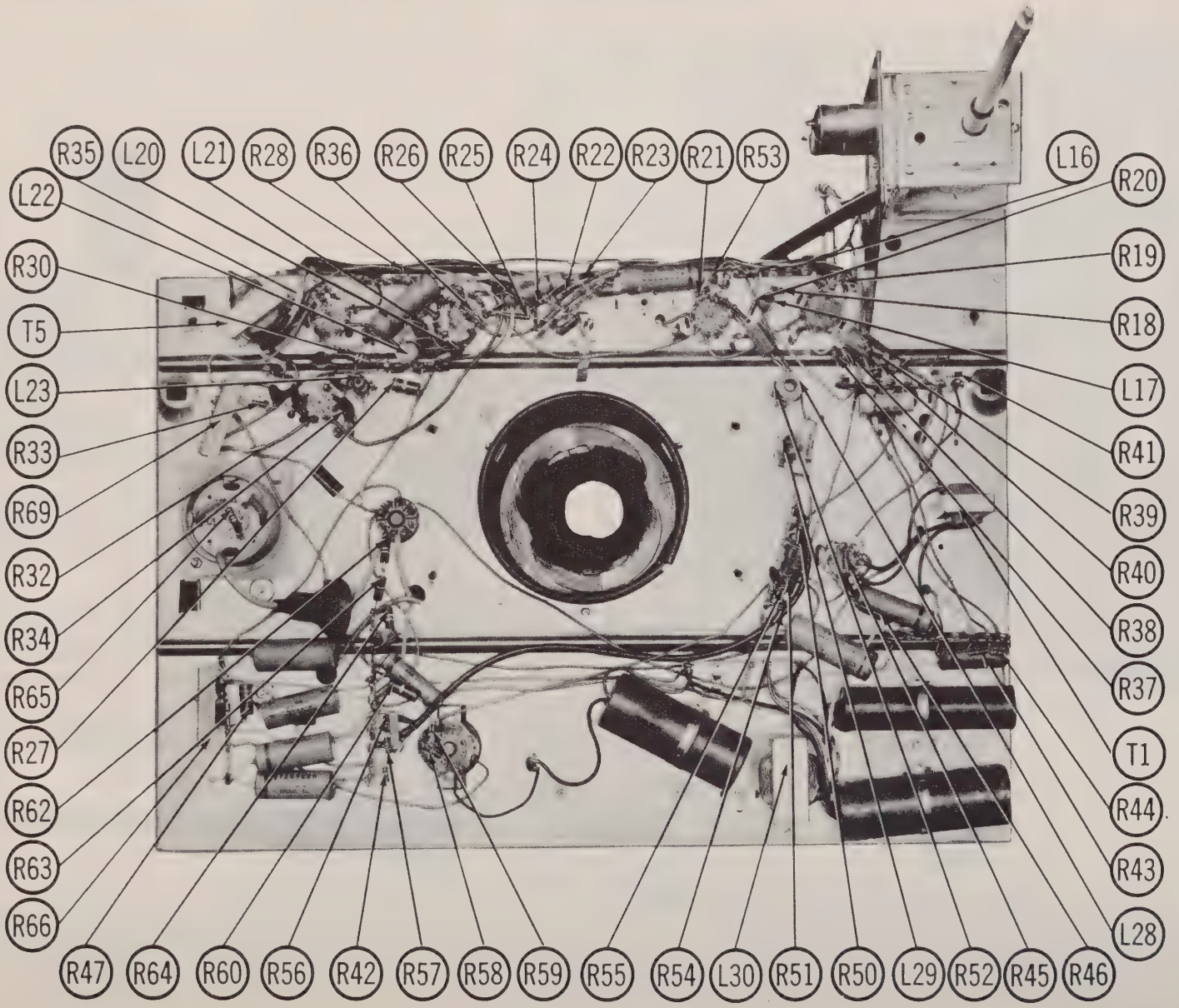
FINE TUNING DRIVE CORD STRINGING



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



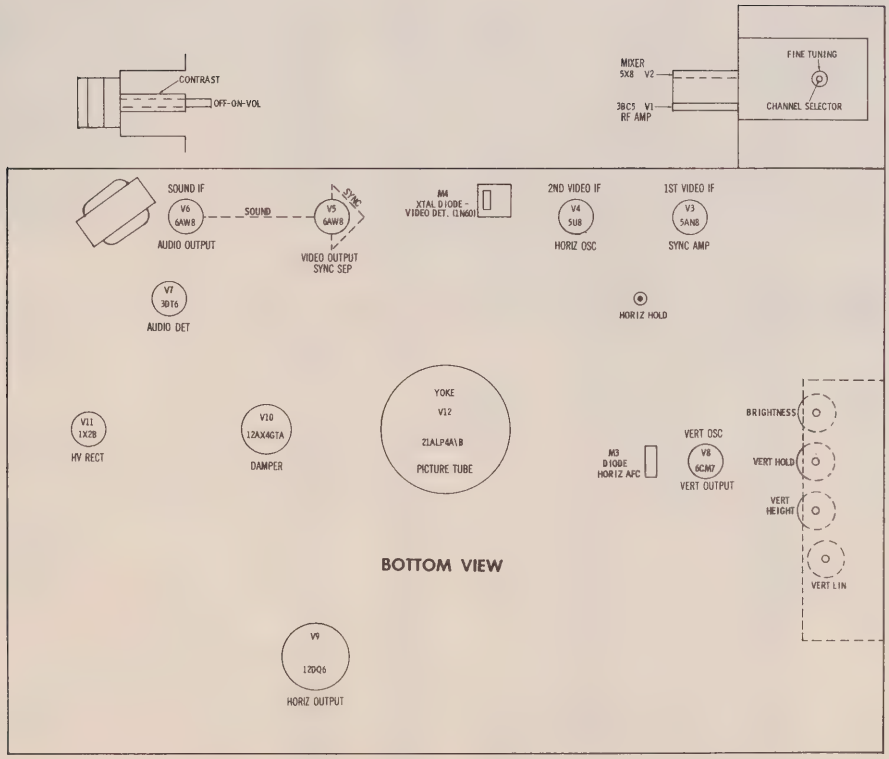
CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	1.1Meg	0Ω	8Ω	8.5Ω	†3700Ω	†7000Ω	0Ω		
V2	5X8	0Ω	10K	†13K	8.5Ω	10Ω	0Ω	220K	†6000Ω	†3800Ω
V3	5AN8	†13K	22K	0Ω	8Ω	6.8Ω	†2900Ω	†2900Ω	1Meg	47Ω
V4	5U8	*240K	.1Ω	†3200Ω	6.8Ω	5.5Ω	†3200Ω	180Ω	0Ω	230K
V5	6AW8	0Ω	2.2Meg	†390K	4Ω	5.5Ω	95Ω	900K	†2700Ω	†5000Ω
V6	6AW8	0Ω	56K	†56K	4Ω	2.5Ω	220Ω	500K	†2700Ω	†475Ω
V7	3DT6	5.3Ω	560Ω	2.5Ω	1.6Ω	†270K	†3200Ω	560K		
V8	6CM7	*4500Ω	NC	0Ω	10Ω	11Ω	*1.8Meg	400K	2.2Meg	2500Ω
V9	12DQ6	NC	11Ω	TP	†8200Ω	120K	NC	14Ω	0Ω	TOP CAP *17Ω
V10	12AX4GTA	NC	NC	800K	NC	†53Ω	NC	41Ω	42Ω	
V11	1X2B	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP *272Ω
V12	21ALP4A	0Ω	1800Ω	Pin 6 †53Ω	Pin 10 †53Ω	Pin 11 †130K	Pin 12 1.6Ω			

† MEASURED FROM OUTPUT OF M1.
* MEASURED FROM PIN 3 OF V10.
NC NO CONNECTION
TP TIE POINT

PROPERTY OF



TUBE PLACEMENT CHART

SET 347 FOLDER 1

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	3BC5	Note 1
V2	Mixer Osc.	5X8	Note 2
V3	1st Video IF Amp. - Sync. Amp.	5AN8	
V4	2nd Video IF Amp. - Horiz. Osc.	5U8	
V5	Video Output-Sync Sep.	6AW8	
V6	Sound IF Amp. - Audio Output	6AW8	
V7	Audio Detector	5DT8	
V8	Vert. Osc. - Vert. Output	6CM7	
V9	Horiz. Output	12DQ6	
V10	Damper	12AX4GTA	
V11	HV Rectifier	1X2B	

Note 1: Some versions may use 6BQ7A in this application.
Note 2: Some versions may use 5AT8 in this application.

PICTURE TUBE

ITEM No	REPLACEMENT DATA: AIRLINE PART No	GBS PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	NOTES
V13	21ALP4A, B	21ALP4A ①	21ALP4A B ①	21ALP4A ①	Aluminized
		21ALP4B ②		②	Silver Screen "85"
		23ALP4	21ALP4	21ALP4	

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	VOLT	AIRLINE PART No	AEROVOX PART No	CORNELL DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No
C1	200	150	R-2128	PRI-100	[illegible]	WS342	TD-200-150	S-110	TVA-1423
C2	140	300	R-2123	PRI-100	K210400	WS427		S-200	TVA-1576
C3A	100	300	R-2127	PR3-047	DC040			T 535	R2340*
B	80	300			BRH501			S-190	
C	100	50							
C4	10	300	R-2123	PRH350V10	BR1235	TC62	TD-12-350	FM-3512	TVA-1604

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP	VOLT	AIRLINE PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C5	470	2000	690077	HVD-30-470	DD30-471	V2T47	HD3-470	DC30347	20GA-T47	
C6	470	2000	690077	HVD-30-470	DD30-471	V2T47	HD3-470	DC30347	20GA-T47	
C7	33		690083	BPD-000033	TCZ-33	G024	GP-22	UC 5422	5GA-Q33	
C8	1000		691040	EF-001	MFT-1000				503C-D1	
C9	12			D1-12	TCZ-12	G019	GP-12	UC-5412	5GA-Q12	
C10	5-20		691026							
C11	10			BPD-00001	DD-100	G018	GP-10	UC-541	5GA-Q1	
C12	3-3		691027		829-3		3115-D	CT565A		
C13	1000			BPD-001	DD-102	KD69	ED-1000	DC521	5GA-D1	
C14	L 2		690034							
C15	1000			BPD-001	DD-102	KD69	ED-1000	DC521	5GA-D1	
C16	1000			BPD-001	DD-102	KD69	ED-1000	DC521	5GA-D1	
C17	33		690080	BPD-000033	DD-330	G029	GP-33	UC-5433	5GA-Q33	
C18	.5-3		691027		829-3		3115-D	CT565A		
C19	L 5		690021	NP0-3IL 5	TCZ-1R5			ZT-5515		
C20	12		690091							
C21	4		690010							
C22	1000			BPD-001	DD-102	KD69	ED-1000	DC521	5GA-D1	
C23	1000			BPD-001	DD-102	KD69	ED-1000	DC521	5GA-D1	
C24	100		691032		TCZ-100					
C25	1000		691040	EF-001	MFT-1000				503C-D1	
C26	1000		691040	EF-001	MFT-1000				503C-D1	
C27	680			BPD-00068	DD-681	KD65	GP-680	UC-5368	5GA-T68	
C28	680			BPD-00068	DD-681	KD65	GP-680	UC-5368	5GA-T68	
C29	1000		691040	EF-001	MFT-1000				503C-D1	
C30	22	200		P288N-22		CUB6P22		GEM-2022	2TM-P22	
C31	1000			BPD-001	DD-102	KD69	ED-1000	DC521	5GA-D1	
C32	1000			BPD-001	DD-102	KD69	ED-1000	DC521	5GA-D1	
C33	1000			BPD-001	DD-102	KD69	ED-1000	DC521	5GA-D1	
C34	1000			BPD-001	DD-102	KD69	ED-1000	DC521	5GA-D1	
C35	1000			BPD-001	DD-102	KD69	ED-1000	DC521	5GA-D1	
C36	1000			BPD-001	DD-102	KD69	ED-1000	DC521	5GA-D1	
C37	4.7			NP0-5IL 7	TCZ-4R7	TZ07		ZT-5547		
C38	.047	200		BPD-05	DF-503	CUB3S47		GEM-4147	2TM-S47	
C39	100			BPD-0001	DD-101	TP34	GP-100	UC-531	5GA-T1	
C40	22		N-9049	NP0-5I22	TCZ-22	TZ14	GP-22			
C41	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C42	3			NP0-5I3	TCZ-3R3		TCO-3	ZT-553		
C43	68			NP0-5I68	TCZ 68	TZ26	GP-68			
C44	47			NP0-5I47	DD-470	TP29	GP-47	UC-5447	5GA-Q47	
C45	10000			BPD 01	DD-103	K082	ED-01	DC511	5HK-S1	
C46	8.2		R-1441	NP0-5I8.2			TCO-8.2			
C47	1000			BPD-001	DD-102	KD69	ED-1000	DC521	5HK-D1	
C48	18		R-2177		TCZ-.8	TZ12	TCO-18			
C49	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C50	5000			BPD-005	DD-502	K080	ED-005	DC525	5HK-D5	
C51	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C52	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C53	.047	200		BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C54	.01	600		BPD-01	DF-103	CUB6S1		GEM-6U	6TM-S1	
C55	.22	400		P488N-22		CUB4P22		GEM 4022	4TM-P22	
C56	.1	600		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C57	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C58	1000			BPD-001	DD-102	KD69	ED-1000	DC521	5HK-D1	
C59	1000			D1-1000	DD-102	GD69	[illegible]	DC521	5GA-D1	
C60	370	500		CM20-471		SWS727		MCE-341	1FM-327	
C61	.022	400		BPD 02	DF-203	CUB4S22		GEM-4122	4TM-S22	
C62	.5	200		P288N-5		CUB4P1		GEM-205	2TM-P5	
C63	.01	600		BPD-01	D6-103	CUB6S1		GEM-6U	6TM-S1	
C64	390	500		CM30-681		1WS168			1FM-368	
C65	.22	600		P688N-22		CUB6P22		GEM-6022	6TM-P22	
C66	5000			BPD 005	DD-502	K080	[illegible]	DC525	5HK-D5	
C67	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C68	.22	600		P688N-22		CUB6P22		GEM-6022	6TM-P22	
C69	.0047	600		BPD-0047	DD-472	CUB6D47		GEM-6247	6TM-D47	
C70	.1	200		P288N-1		CUB2P1		GEM-201	2TM-P1	
C71	1000		R-1449	BPD-001	DD-102	KD69	ED-1000	DC521	5HK-S1	
C72	[illegible]			BPD-001	DD-102	KD69	ED-1000	DC521	5HK-S1	
C73	[illegible]			BPD-001	DD-102	KD69	[illegible]	DC521	5HK-S1	
C74	[illegible]			BPD-001	DD-102	KD69	[illegible]	DC521	5HK-S1	
C75	.01	600		BPD-01	D6-103	CUB6S1		GEM-6U	6TM-S1	
C76	[illegible]			BPD-001	DD-102	KD69	ED-001	DC521	5HK-S1	Note 1

Note 1. Used only in model GRX4120A.

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: AIRLINE PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No	INSTALLATION NOTES
R1A	1000Ω	½	R-2423					Contrast (Note 1)
B	500K	½						Volume
C	Switch							Attach to R1B
R2A	100K	½	R-1453	AB-40	A47-100K-S	Q11-128	TAP15L	Brightness
B	Shaft			AK-19	RN-3	TQ	Not Req.	Attach to R2A
R3A	500K	½	R-1413	AB-50	A47-500K-S	Q11-133		Vert. Hold
B	Shaft			AK-19	RN-3	TQ		Attach to R3A
R4A	5Meg	½	R-1412	AB-84	A47-5Meg-S	Q11-140	TAP355L	Height
B	Shaft			AK-19	RN-3	TQ	Not Req.	Attach to R4A
R5	5000Ω	2	R-2046		39-5000			Vert. Linearity

Note 1: Alternate part #R-2458 may be used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING: OHMS	WATT	REPLACEMENT DATA: AIRLINE PART No	IRC PART No	NOTES
R6	470K			BTS-470K	
R7	470K			BTS-470K	
R8	10K			BTS-10K	
R9	2200Ω			BTS 2200	
R10	3300Ω			BTS-3300	
R11	1000Ω			BTS-1000	
R12	4700Ω			BTS-4700	
R13	220K			BTS-220K	
R14	1000Ω			BTS-1000	
R15	3300Ω			BTS 3300	
R16	10K			BTS-10K	
R17	10K			BTS-10K	
R18	150Ω			BTS-150	
R19	47Ω			BTS-47	
R20	470Ω			BTS 470	
R21	180Ω			BTS-180	
R22	6800Ω			BTS-6800	
R23	1Meg			BTS-1Meg	
R24	3.9Meg		N-5473	BTS-3.9Meg	
R25	1Meg			BTS-1Meg	
R26	82Ω		N-5857	BTS-82	
R27	4700Ω	2		BTB-4700	
R28	100K			BTS-100K	
R29	56K			BTS-56K	
R30	56K	1		BTA-56K	
R31	560K			BTS-560K	
R32	270K			BTS-270K	
R33	470Ω			BTS-470	
R34	560Ω			BTS-560	
R35	220Ω			BTS-220	
R36	390K			BTS-390K	
R37	22K			BTS-22K	
R38	560K			BTS-560K	

ITEM No	RATING: OHMS	WATT	REPLACEMENT DATA: AIRLINE PART No	IRC PART No	NOTES
R39	4700Ω			BTS-4700	
R40	4700Ω			BTS-4700	
R41	390K			BTS-390K	
R42	470K			BTS 470K	
R43	1800Ω			BTS-1800	
R44	3300Ω			BTS-3300	
R45	2.2Meg			BTS-2.2Meg	
R46	820Ω	1		BTA-820	
R47	2700Ω	2		BTB-2700	
R48	680Ω				
R49	680Ω				
R50	22K				
R51	180K				
R52	47K				
R53	100K				
R54	10K				
R55	56K				
R56	180K				
R57	56K				
R58	130K				
R59	47Ω		N-7787		
R60	8200Ω	2		BTB-8200	
R61	5600Ω			BTB-5600	
R62	150K	1			
R63	150K	1			
R64	150K	1			
R65	2.2Ω		R-2178	BW½-2.2	
R66	27Ω	10	R-2125	PW10-25	
R67	27Ω	10	R-2125	PW10-25	
R68	27Ω	10	R-2125	PW10-25	
R69	2700Ω	10	R-2134	PW10-3500	Note 1
R70	5.5Ω	5	R-1409	FR5.5	
R71	220K			BTS-220K	

Note 1: Model GRX-4120A uses a 2100Ω 10W resistor (part #R-2330) in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: AIRLINE PART No	Halldorson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No.
T1	Vert. Osc. Trans.	R-.425 R-2061 ①	B6702 ②	A-3003 ②	209T1 ②	V405 ②	A-8125 ②	25A03 ②	A-97X ②
T2	Horiz. Output Trans.	R-2057-1 R-2057 ①	FB448*③ ③	HVO-58* § ③		X126*§③	HO-250* § ③	FLT-80* § ③	D-88*§③
T3	Vert. Output Trans.	R-2058	Z1806 ②	A-3039 ②	226T1 ②	V312 ②	A-8141 ②	26S54 ②	A-104X ②
T4A	Yoke(90°)Horiz(2.5MH	R-2060	DF607 ②	MDF-82 ③	235D1 ④	T90F18/43 §	DY-16A ③	Y-16 ③	Y-41-1 ③
B	Vert(42MH)								

① Alternate Airline part number.
② Drill new mounting hole(s).
§ Use original mounting screws, and trim term board to duplicate original.
③ Use original yoke damping network if necessary.
* This part may be superseded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	8	8	8		8	8	8	8
	7	3	6		4	3	6	3
	3	N.C. See Note §	N.C. See Note §		N.C. See Note §	N.C. See Note §	N.C. See Note §	N.C. See Note §
	5	N.C. See Note ⑤	N.C. See Note ⑤		N.C. See Note ⑤	N.C. See Note ⑤	N.C. See Note ⑤	N.C. See Note ⑤
	2	2	2		2	2	2	2
Special Notes →		§ ⑤	§ ⑤		§ ⑤		§ ⑤	§ ⑤

§ To provide horiz. yoke damping, connect approx. 50-100MMF④ 2KV in series with resistor (R64) across horiz. yoke terms #3 and #7.
⑤ Remove capacitor (C69) from circuit, and to insure sufficient width, connect approx. 100MMF④ 4KV across horiz. yoke terms #3 and #5.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: AIRLINE PART No	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	13.5K	3-4Ω	R-2059	Z1118	A-3934	A-3881	26S47①		① Drill one new mtg. hole.

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: AIRLINE PART No	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	R-2366	4A07	

COILS (RF-IF)

ITEM No.	USE	AIRLINE PART No.	NOTES
L1	Ant. Trans.	346187	Note 1
L2	41MC Trap	343095	
L3	FM Trap	342120	
L4	Ant. Coils	135790	Complete Ass'y.
L5	Ant. Coil	343107	Channel 13
L6	FIL Choke	342065	
L7	RF Coils	135761	Complete Ass'y.

ITEM No.	USE	AIRLINE PART No	NOTES
L8	RF Coil	342106	Channel 13
L9	Mixer Grid Coils	135774	Complete Ass'y. Channel 13
L10	Mixer Grid Coil	342105	
L11	Osc. Coils	135775	Complete Ass'y.
L12	Osc. Coil	343104	Channel 13
L13	Osc. Coil	343118	Channel 13
L14	Conv. Plate	345207	

Note 1. Complete assembly part #135792. Includes R6, R7, C5, C6 and L1.

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L15	1st Video IF	R-2068		TV-1R	6235	
L16	RF Choke	R-1431	19-8038*		4624*	28 Microhenries; Wound on 4700Ω resistor.
L17	2nd Video IF	R-2054				
L18	3rd Video IF	R-2055				
L19	Series Peaking Coil	R-1470	19-3093	TV-1R1	6177	88 Microhenries
L20	Series Peaking Coil	R-1950		TV-190*	6134*	355 Microhenries; Wound on 12K resistor.
L21	4.5MC Trap	N-9011	20-1004	TV-1R	1469	
L22	Shunt Peaking Coil	R-1949			4652*	1109 Microhenries; Wound on 4700Ω resistor.
L23	1st Sound IF	R-1836	20-1004	TV-1R	1469	
L24	2nd Sound IF	R-2160				
L25	Quadrature Coil	R-2159	20-1005		1470	
L26	RF Choke	R-2065				Note 2
L27	FIL Choke	R-1621				Note 2

Note 2: Used with model GRX4120A.
* Parallel with 4700Ω resistor.
▲ Parallel with 12K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.: PRI.	SEC.	REPLACEMENT DATA: AIRLINE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L28	75Ω		R-1408							Tap② 53Ω Horiz. Osc. Horiz. Waveform
L29	45Ω		R-1405							

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE 10 CURRENT 1000 ∿	REPLACEMENT DATA: AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L30	.155A	57Ω	.94HY	R-2056	C5041 ①	C-3896 ①	C-2338①	28C44①	C-83X ①

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	AIRLINE PART No	REPLACEMENT DATA	
K1	Sync Circuit	100K, 330K, 2.2Meg, 270MMF, 10000MMF, 25MMF	R-1459	Aerovox Centralab Sprague	PR531 PC-280 ST-1
K2	Vert. Integrator	22K, 10K, 4700MMF, 470MMF	R-1458	Aerovox Centralab Sprague	PA-383-2 PC-106 V-5

SELENIUM RECTIFIER

ITEM No.	RATING: CURRENT	REPLACEMENT DATA: AIRLINE PART No	FEDERAL PART No	INTERNATIONAL PART No	MALLORY PART No	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.155A	R-2147	1028A	6RS250	6S250	6Q3	250A	
M2	.155A	R-2147	1028A	6RS250	6S250	6Q3	250A	

SELENIUM DIODE

ITEM No.	RATING: CURRENT	REPLACEMENT DATA: AIRLINE PART No	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M3		R-2141		1T1				Horiz. Phase Det. (Pigtail)

CRYSTAL DIODES

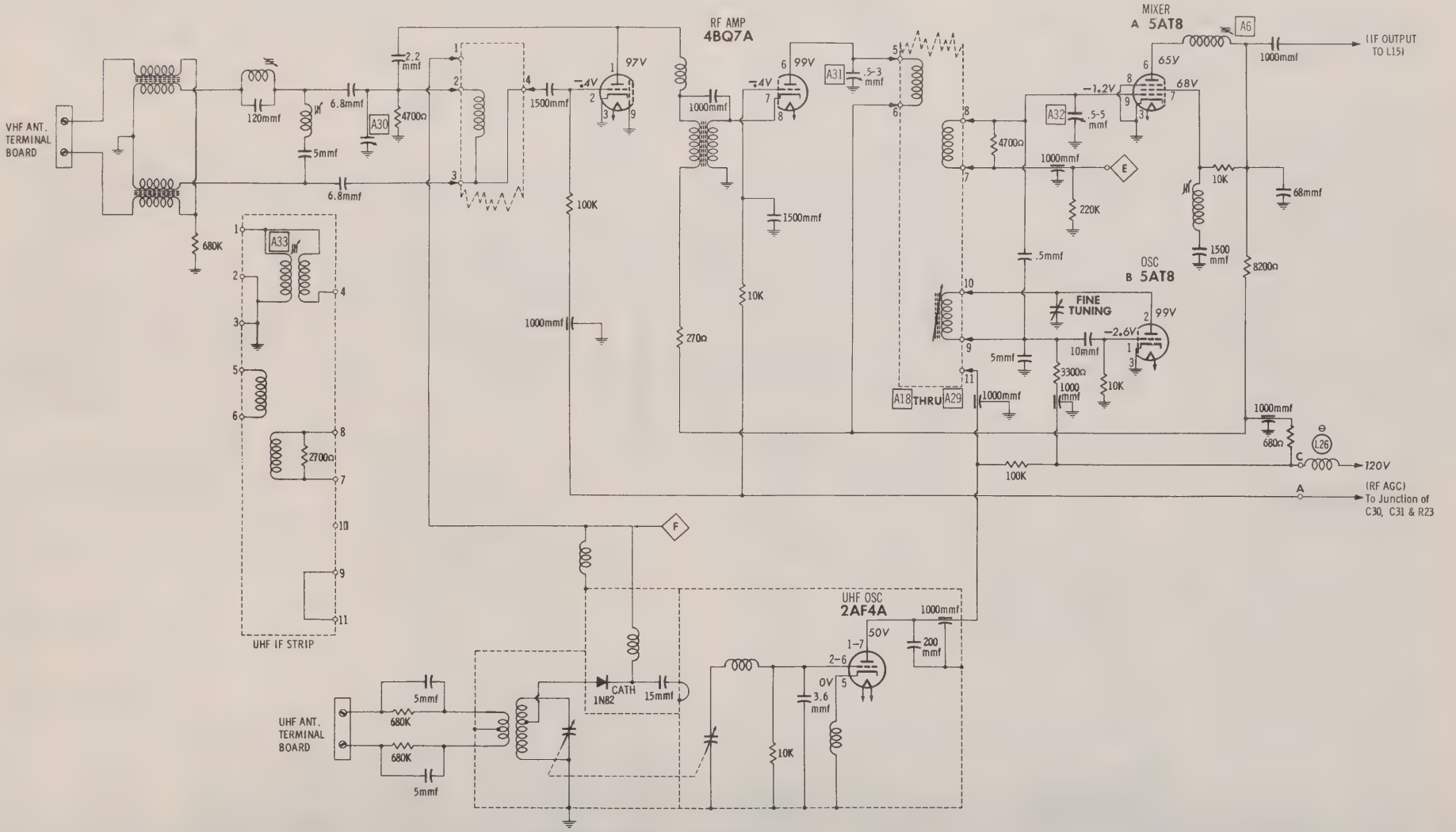
ITEM No.	ORIG. TYPE	REPLACEMENT DATA: AIRLINE PART No.	SYLVANIA PART No.	NOTES
M4	1N60	1N60 ①	1N60	Video Detector (Pigtail)

① 1N64 may be used in some versions.

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M5	Tuner	R-2409*	VHF (13 Position) Model GRX4020A.
	Tuner	R-2451a	UHF-VHF, Model GRX4120A.
M6	Centering Device	R-2043	
M7	Ion Trap	R-2044	
	Knob	R-2479	VHF Channel Selector, Model GRX4020A.
	Knob	R-1916	Fine Tuning, Model GRX4020A.
	Knob	R-2480	On-Off-Volume, Model GRX4020A.
	Knob	R-1915	Contrast, Model GRX4020A.
	Knob	R-2482	VHF Channel Selector, Model GRX4120A.
	Knob	R-2483	Fine Tuning, Model GRX4120A.
	Knob	R-2481	UHF Channel Selector, Model GRX4120A.
	Knob	R-2484	On-Off-Volume, Model GRX4120A.
	Knob	R-2485	Contrast, Model GRX4120A.
	Safety Glass	R-2419	All Models.

* When ordering specify RCC tuner #T3L.
■ When ordering specify SCP TEAS tuner #021.



UHF - VHF TUNER PART NO. R-2451----Used with Model GRX-4120A

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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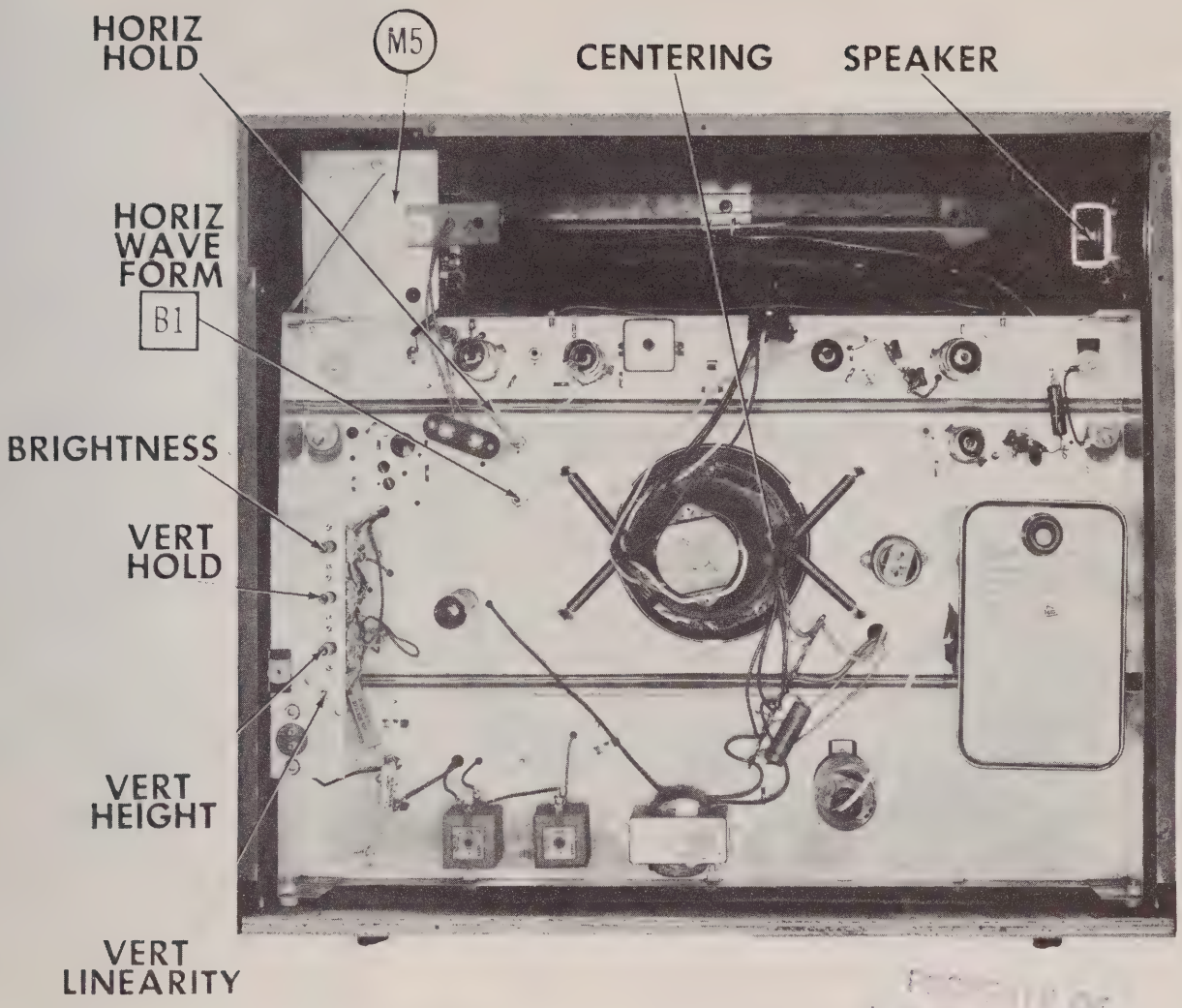
ALTERNATE UHF-VHF TUNER SCHEMATIC



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV signal, preferably with a test pattern. Adjust the contrast for a normal picture. Adjust the horizontal hold until the picture synchronizes horizontally.
2. Connect the vertical amplifier of the scope to point Ⓓ thru a low capacity probe. Connect the low side to chassis. Adjust the horiz. waveform slug (B1) until a waveform similar to Fig. 6 is obtained. Make sure the round peak is no more than 10% below the sharp peak or double triggering may result. During adjustment of B1 keep the picture in sync with the horizontal hold.
3. Adjust the horizontal hold to the point that the picture remains in sync when the tuner is switched off channel and back again.

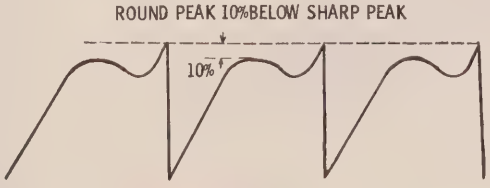
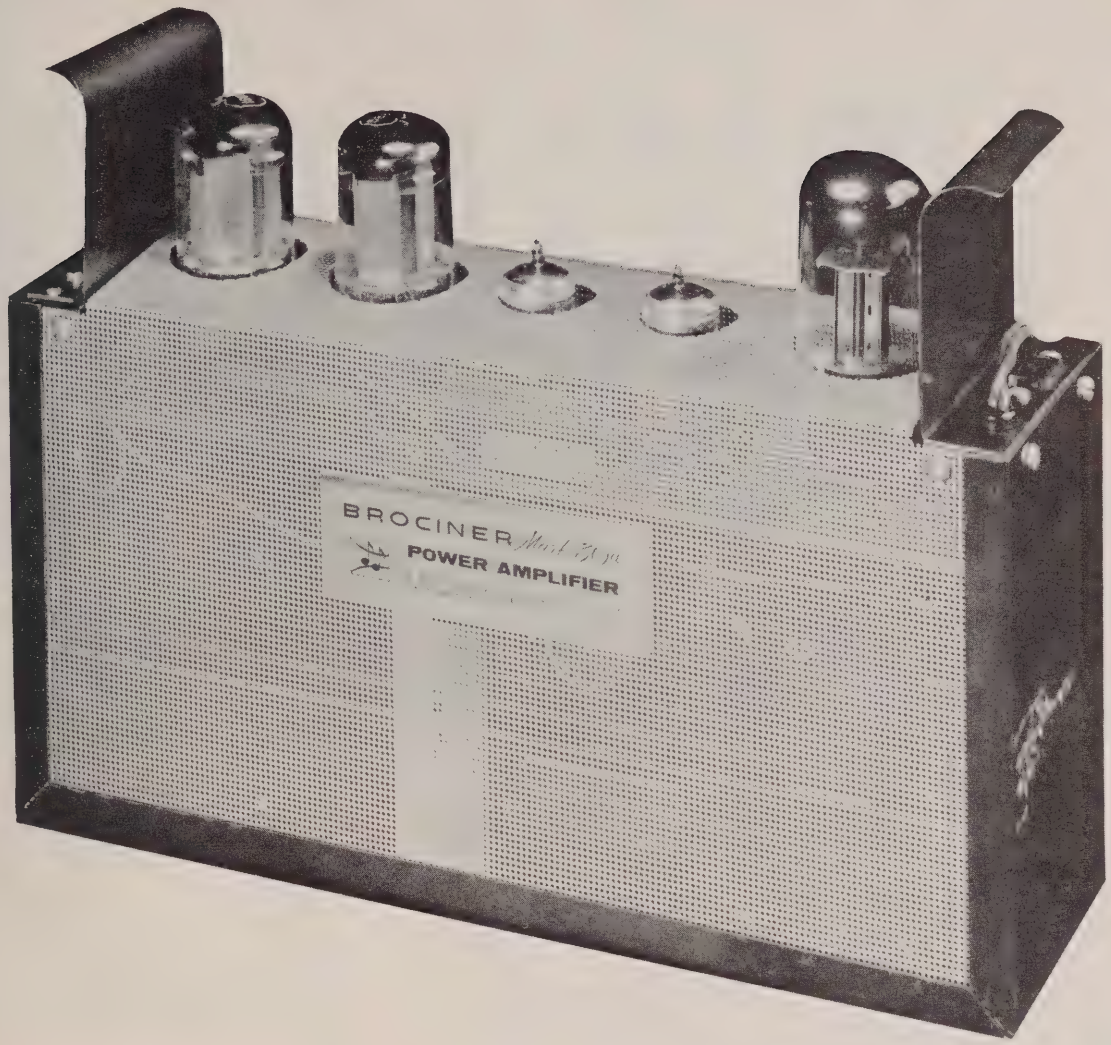


FIG. 6

BROCINER MODEL Mark 30A

BROCINER MODEL Mark 30A



BROCINER MODEL Mark 30A

TRADE NAME	Brociner Model Mark 30A
MANUFACTURER	Brociner Electronics Corp., 344 E. 32nd. St., New York 16, N.Y.
TYPE SET	AC Operated Audio Amplifier
TUBES (Five)	Types 12AX7 AF Amp.-Phase Inv., 12AX7 Driver, (2) 5881 Output, 5V4GA Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING 1.1 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

BROCINER
MODEL Mark 30A

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. -Phase Inv.	12AX7	
V2	Driver	12AX7	
V3	Output	5881	

ITEM No.	USE	TYPE	NOTES
V4	Output	5881	
V5	Rectifier	5V4GA	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	BROCINER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	8	600		PRS600V8	BRHV608	TC92	TD-8-600		TVA-1962
C2	8	600		PRS600V8	BRHV608	TC92	TD-8-600		TVA-1962
C3	16	500		PRS500V16	BR1650	TC83	TD-16-600		TVA-1905
C4	16	500		PRS500V16	BR1650	TC83	TD-16-600		TVA-1905
C5	100	50		PRS50V100	BR1005	TC3501	TD-100-50	MTH-5010	TVA-1310

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	BROCINER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	.02	400		BPD-02	DD-203	CUB4S2	ED-02	GEM-412	4TM-S2	
C7	120	500		NP0-S1120	D6-121	5R5T12	ED-120		MS-312	
C8	220	500		NP0-S1220	D6-221	5R5T22	ED-220		MS-322	Note 1
C9	.1	600		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C10	.1	600		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C11	.1	600		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C12	.1	600		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C13	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	

Note 1. Some versions may use 100MMF in this application.

RESISTORS

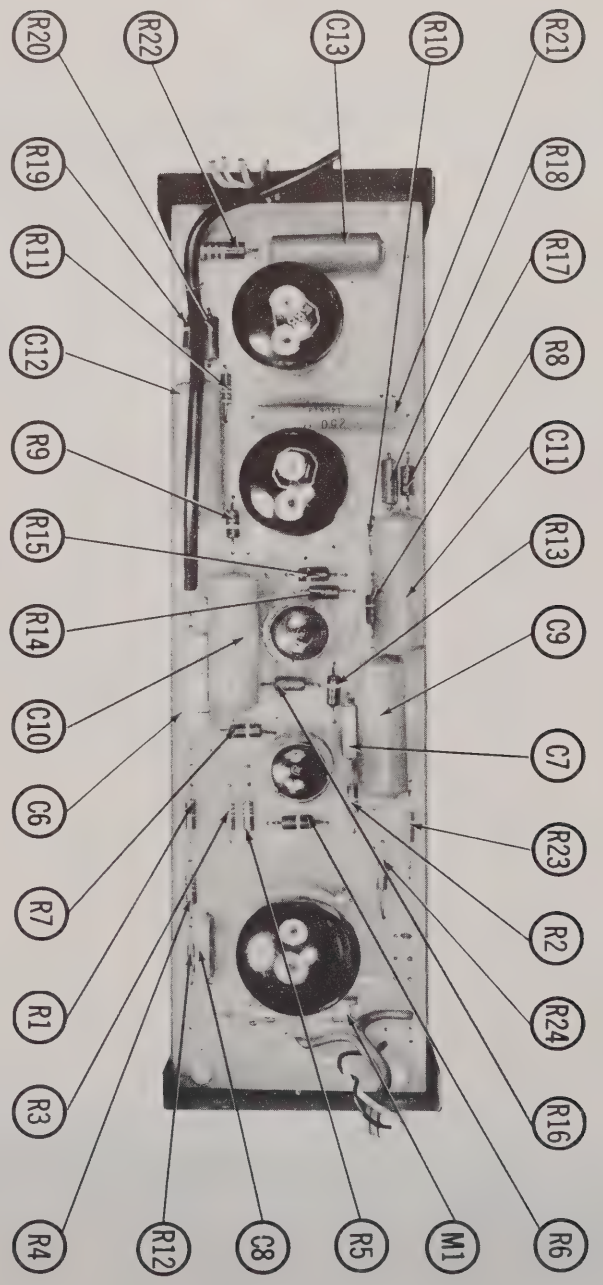
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	BROCINER PART No.	IRC PART No.	
R1	1Meg			BTS-1Meg	
R2	15K			BTS-15K	
R3	330K			BTS-330K	
R4	560Ω			BTS-560	
R5	560Ω			BTS-560	
R6	100K			BTS-100K	Note 1
R7	100K			BTS-100K	Note 1
R8	27K			BTS-27K	Note 2
R9	27K			BTS-27K	Note 2
R10	470K			BTS-470K	Note 3
R11	470K			BTS-470K	Note 3
R12	15K			BTS-15K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	BROCINER PART No.	IRC PART No.	
R13	100K	1		BTA-100K	
R14	1600Ω			BTS-1600	
R15	100K	1		BTA-100K	
R16	1600Ω			BTS-1600	
R17	100K			BTS-100K	
R18	1000Ω			BTS-1000	
R19	100K			BTS-100K	
R20	1000Ω			BTS-1000	
R21	250Ω	10		PW10-250	
R22	180Ω	1		BTA-180	
R23	22K			BTS-22K	
R24	22K			BTS-22K	

Note 1. R6 and R7 are matched resistors.
Note 2. R8 and R9 are matched resistors.
Note 3. R10 and R11 are matched resistors.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	BROCINER PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @1.1A	780VCT @.137A	5VAC @ 2A	6.3VCT @ 2.5A	1127					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	BROCINER PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6700Ω	16Ω tap @ 8Ω, 4Ω	1129	H4103				S-142A①	① Drill new mounting hole.

FILTER CHOKE

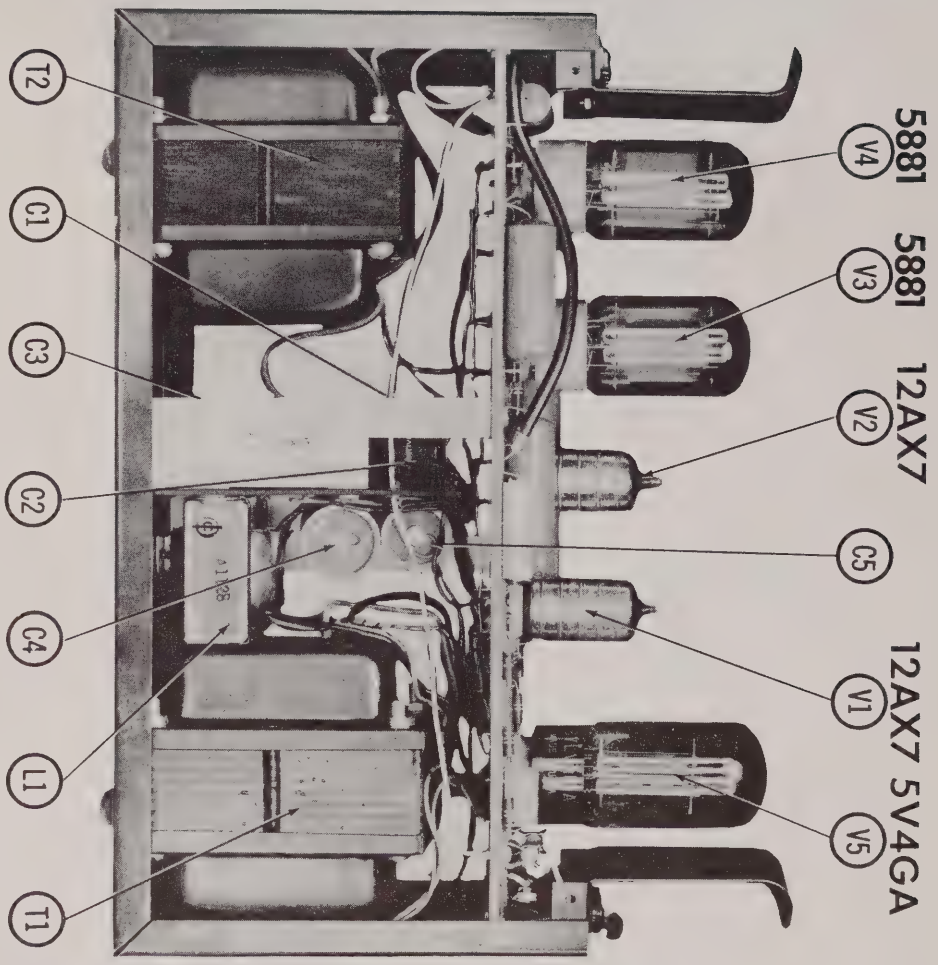
ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	BROCINER PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L1	.137A	100Ω	4.2 HY	1128					

FUSES

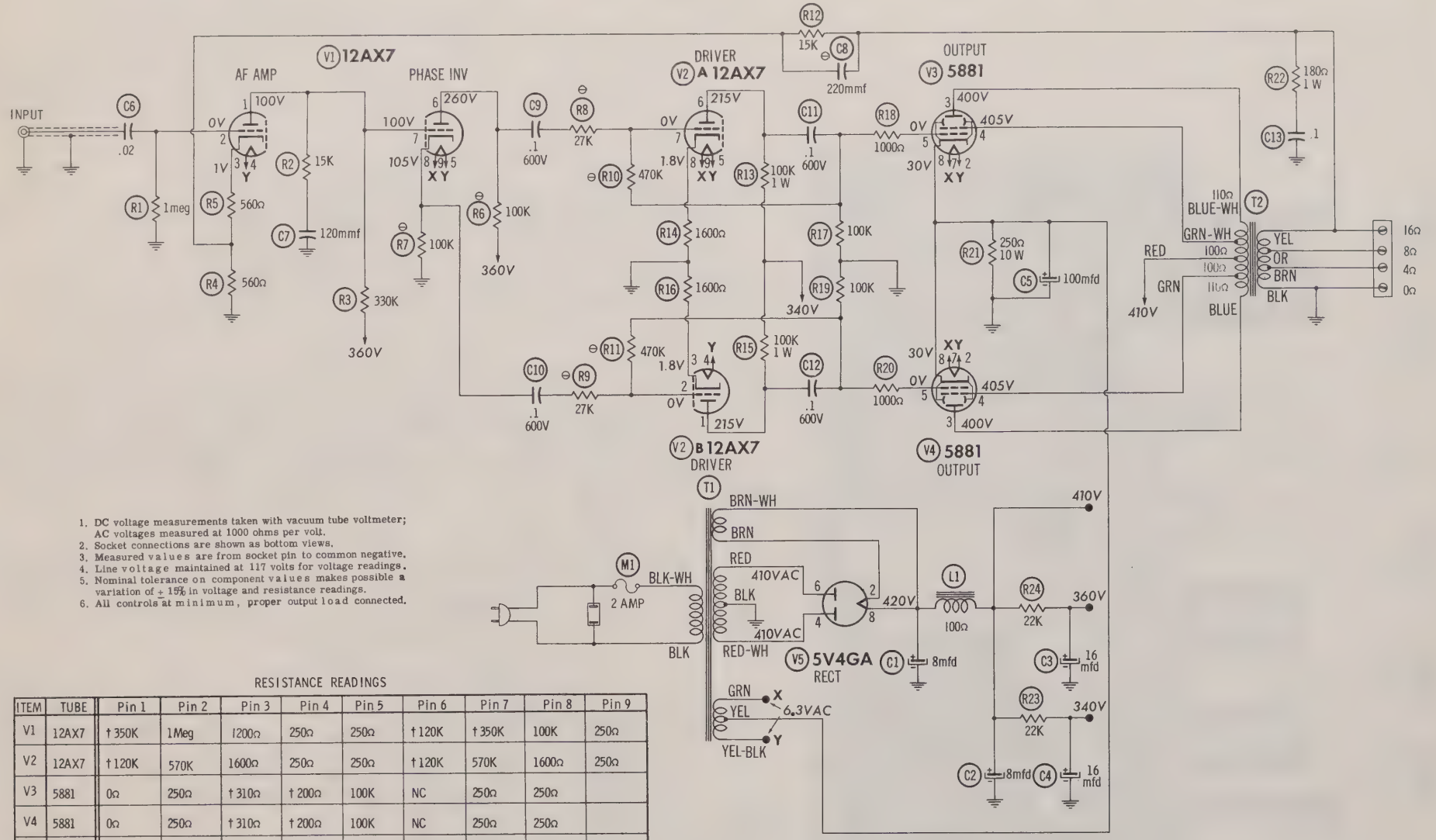
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			BROCINER PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	2A 250V			312002. (3AG 2A	101001 *	AGC 2	4548 *

* Two required.

CHASSIS—BOTTOM VIEW



BROCINER MODEL Mark 30A



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†350K	1Meg	1200Ω	250Ω	250Ω	†120K	†350K	100K	250Ω
V2	12AX7	†120K	570K	1600Ω	250Ω	250Ω	†120K	570K	1600Ω	250Ω
V3	5881	0Ω	250Ω	†310Ω	†200Ω	100K	NC	250Ω	250Ω	
V4	5881	0Ω	250Ω	†310Ω	†200Ω	100K	NC	250Ω	250Ω	
V5	5V4GA	NC	100K	NC	70Ω	NC	70Ω	NC	100K	

† MEASURED FROM PIN 8 OF V5.
NC NO CONNECTION.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

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BUICK
MODEL 981707

TRADE NAME	Buick Model 981707 (For 1956 Buick Automobiles)
MANUFACTURER	Delco Radio Div., G.M. Corp., Kokomo, Ind.
TYPE SET	Battery Operated Custom Built AM Automobile Receiver
TUBES (Seven)	Types 12BA6 RF Amplifier, 12BE6 Converter, 12AU6 IF Amplifier, 12BF6 Det.-AVC-AF Amp., (2) 12V6GT Output, 0Z4 Rectifier
POWER SUPPLY	12 Volt Storage Battery RATING 3.4 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	550KC-1615KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	262KC (400∿Mod)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	82MMF	High side thru 82 MMF to antenna receptacle. Low side to chassis.	1615KC	"	"	A5, A6, A7	Check setting of oscillator core (A8). Rear of core should be 1 25/32" from mounting end of coil form. If necessary, make adjustment and reseal. Adjust A5, A6 and A7 for maximum output.
3.	"	"	1100KC	Tune to 1100KC signal	"	A9, A10	Adjust for maximum output.
4.	"	"	1615KC	High freq. end stop	"	A6, A7	Readjust for maximum output.
5.	"	"	1100KC	Tune to 1100KC signal	"		If necessary, with pointer adjustment screw set point on the second "1" of "110" on dial.

6. With radio installed in car and antenna fully extended, tune in a weak station between 600KC and 1000KC, adjust A7 for maximum volume.

PUSHBUTTON ADJUSTMENT

Pull pushbutton to the left and out. Tune manually to desired station. Press pushbutton all the way in. Repeat procedure for remaining pushbuttons.

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PARTS LIST AND DESCRIPTIONS

BUICK
MODEL 981707

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Converter	12BE6	
V3	IF Amplifier	12AU6	
V4	Det. -AVC-AF Amplifier	12BF6	
V5	Output	12V6GT	
V6	Output	12V6GT	
V7	Rectifier	0Z4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■20	400	6322	AFH3-120	CO990	FP345.8	TMT-106	T-550	TVL-3678
B	▲20	400							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	DELCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	200	6512	BPD-05	DF-503	CUB2S5		GEM-215	2TM-S5	
C3	.1	400	6513	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C4A	39		6366				TC3-39			
B	39						TC3-39			
C5	180		7257424							
C6	10		G-100	DI-00001	DD-100	G018	ED-10	UC-541	5GA-Q1	
C7	180		G-181		TCN-180	N049	TC7-180			
C8	.004	600	6530	BPD-004	D6-402	CUB6D4	GP-4000	GEM-624	6TM-D4	
C9	.005	600	6531	BPD-005	D6-502	CUB6D5	GP-5000	GEM-625	6TM-D5	
C10	.01	400	6354	BPD-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C11	220		G-221	DI-00022	DD-221	G051	ED-220	UC-5322	5GA-T22	
C12	.2	400	6514	P488N-2		CUB6P2		GEM-402	4TM-P2	
C13	.025	400	1211232	P488N-025		CUB4S22		GEM-4025	4TM-S25	
C14	.004	800	6564	P1088N-004	DD16-402	CUB16D4		GEM-1024	10TM-D4	
C15	.007	1600	6567	P1688N-007	DD16-702	CUB16D7		GEM-1627	MD-D7	
C16	.47	100	6592	VHC-36		ST2P5		RF-480	68P20	
C17	.5	100	6592	VHC-36		ST2P5		RF-480	68P20	
C18			1217848							

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	200K		7266996				UE13725	Tone - Panel
B	1Meg						Not Req.	Volume-Rear- Tap @ 200K
C	Switch						Not Req.	Attach to R1B

RESISTORS

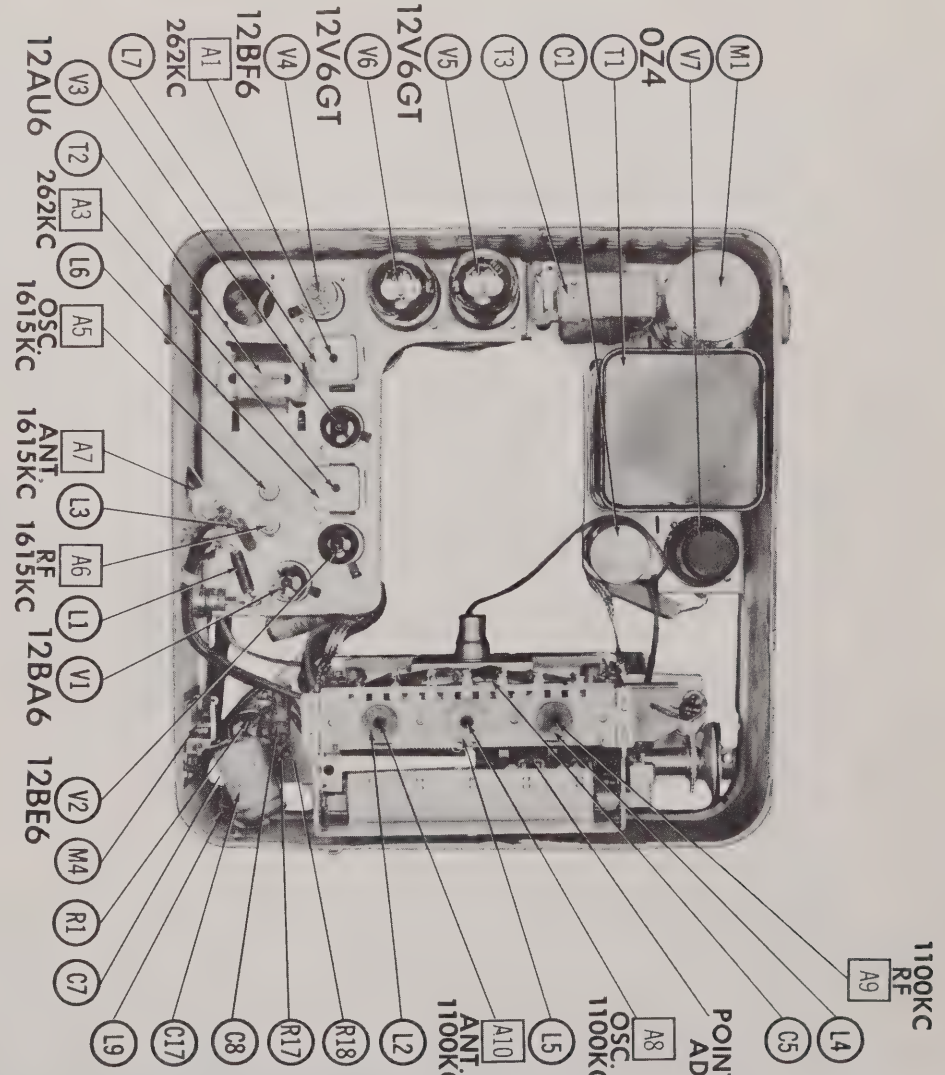
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DELCO PART No.	IRC PART No.	
R2	2.2Meg		1239	BTS-2.2Meg	
R3	15K	2	1277	BTB-15K	
R4	82Ω		1112	BTS-82	
R5	330K		1229	BTS-330K	
R6	22K		1215	BTS-22K	
R7	15K	1	1253	BTA-15K	
R8	1Meg		1235	BTS-1Meg	
R9	1Meg		1235	BTS-1Meg	
R10	150Ω			BTS-150	Note 1
R11	47K		1219	BTS-47K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DELCO PART No.	IRC PART No.	
R12	820K		1234	BTS-820K	
R13	1Meg		1235	BTS-1Meg	
R14	1000Ω		1125	BTS-1000	
R15	3300Ω		1131	BTS-3300	
R16	47K		1219	BTS-47K	
R17	47K	1	1259	BTA-47K	
R18	470K		1231	BTA-470K	
R19	360Ω 5%	1	7234563	BW1-360	
R20	1800Ω	7	1314573	1 3/4A-1750	
R21	15K	1	1253	BTA-15K	

Note 1. Some versions may use 270Ω in this application (part #1118).

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12.6V @2A	400VCT @.058A			6066				22R89	

TRANSFORMER (AUDIO INPUT)

ITEM No.	Resistance		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	1800Ω		6061						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	7800Ω	3-4Ω	6063	Z1002	A-2936	A-3852	22S87	S-15X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DELCO PART No.	QUAM PART No.	
SP1	6" x 9"	PM	3-4Ω	7264667	69A2	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		DELCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coupling Coil	7255738	19-1004		4610	
L2	Ant. Coil	7258915				
L3	RF Coupling Coil	7240251	19-6022		4626	
L4	RF Coil	7258914				
L5	Osc. Coil	7260499				
L6	Input IF	1218725	16-6752	BC-350	12-H1	
L7	Output IF	1218726				
L8	Fil. Choke	1217846				
L9	Fil. Choke	1217846				

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				DELCO PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	12.6V	115∿	8550	6330	G883	6330	

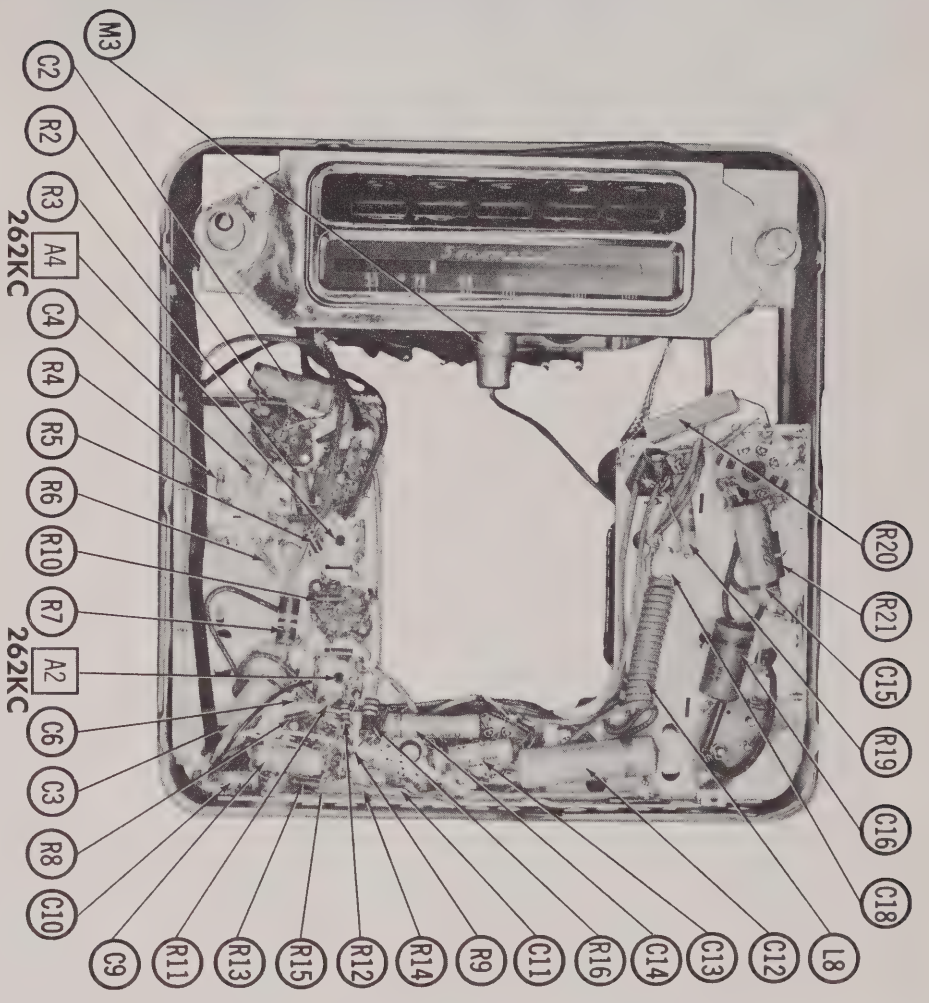
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			DELCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2		7½A					SFE 7½	HRH

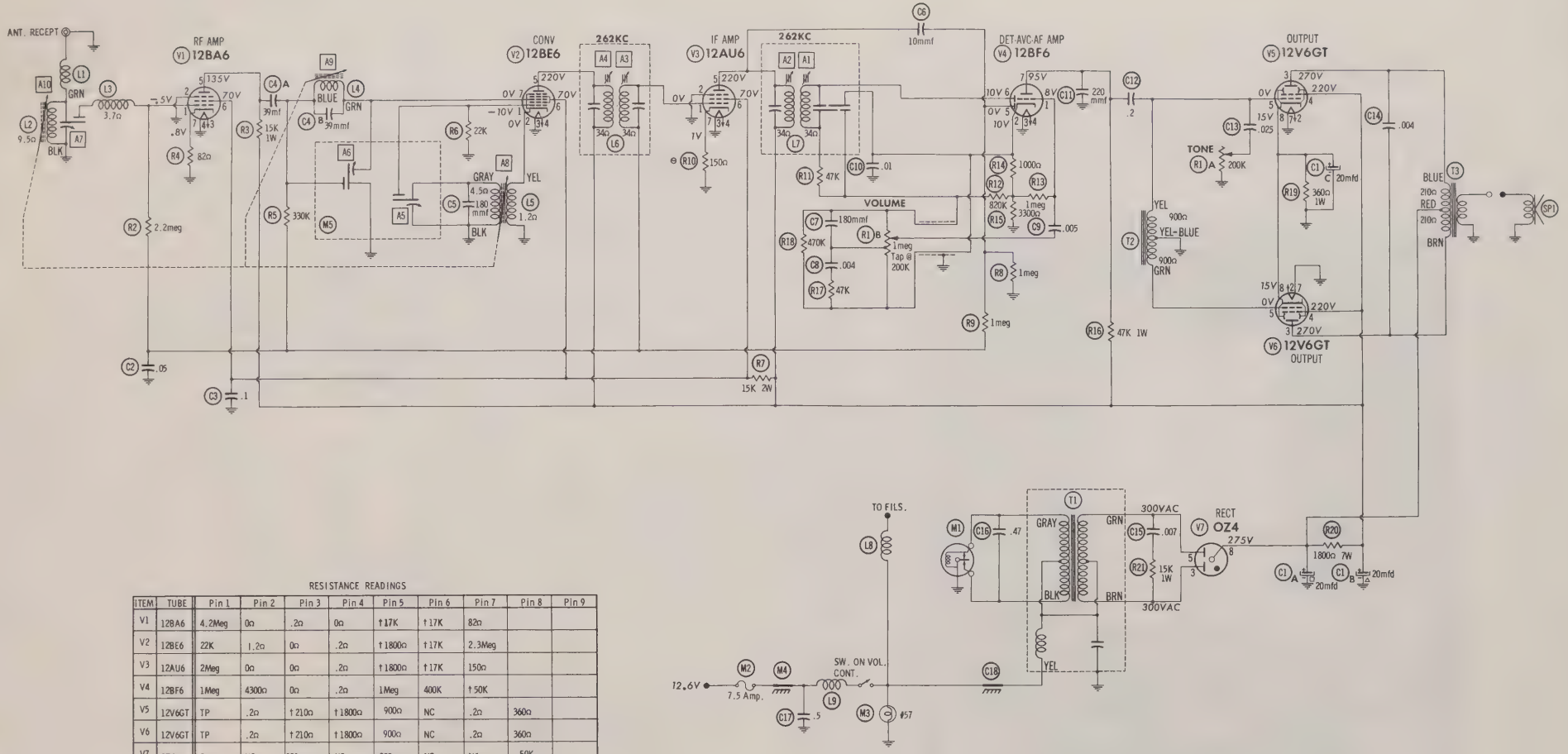
MISCELLANEOUS

ITEM No.	PART NAME	DELCO PART No.	NOTES
M3	Dial Light		#57
M4	Spark Plate	1219768	
M5	Trimmer Cap.	7242454	Dual: A5 (Osc.), A6 (RF)
A7	Trimmer Cap.	7266990	Ant.
	Dial	7266792	
	Push button & Slide Assy.	1220901	(5 used)
	Knob	1170296	On-off-volume & tuning
	Knob	1170196	Dummy
	Knob	1170180	Tone

CHASSIS—BOTTOM VIEW



BUICK MODEL 98/707



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BA6	4.2Meg	0Ω	.2Ω	0Ω	†17K	†17K	82Ω		
V2	12BE6	22K	1.2Ω	0Ω	.2Ω	†1800Ω	†17K	2.3Meg		
V3	12AU6	2Meg	0Ω	0Ω	.2Ω	†1800Ω	†17K	150Ω		
V4	12BF6	1Meg	4300Ω	0Ω	.2Ω	1Meg	400K	†50K		
V5	12V6GT	TP	.2Ω	†210Ω	†1800Ω	900Ω	NC	.2Ω	360Ω	
V6	12V6GT	TP	.2Ω	†210Ω	†1800Ω	900Ω	NC	.2Ω	360Ω	
V7	0Z4	0Ω	NC	220Ω	NC	220Ω	NC	NC	50K	

† MEASURED FROM PIN 8 OF V7.
NC NO CONNECTION
TP TIE POINT

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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DEWALD MODEL K-544

DEWALD MODEL K-544

DEWALD MODEL K-544

TRADE NAME	Dewald Model K-544
MANUFACTURER	Dewald Radio Mfg. Corp., 35-15 37th Ave., Long Island City 1, N. Y.
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	9 Volts DC
RATING	14MA @ 9 Volts DC
TUNING RANGE—BROADCAST	540KC - 1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna lug on tuning gang. Low side to chassis.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2	Adjust for maximum output.
2.		Loop	1650KC	"	"	A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal.	"	A4	"
4.		"	540KC	Tuning gang fully closed.	"	A5	Adjust for maximum output while rocking tuning gang.

PROPERTY OF
L. [illegible]

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

DEWALD MODEL K-544

TRANSISTORS

ITEM No.	USE	TYPE	NOTES
X1	Converter	2N112	Note 1
X2	IF Amplifier	2N112-A	Note 2
X3	AF Amplifier	2N132	
X4	Output	2N138	

Note 1: Type CK-760 may be used in some versions.
Note 2: Type CK-760-A may be used in some versions.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DEWALD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	50	10		XPP10V50	NL50-10		ML40-15		R2305*
C2	8	3		XPP15V10		TAP30-8	ML8-6		TE-1086
C3	6	3		XPP3V6	NL6-3	TAW4A6	ML6-6		TE-1084
C4	50	3		SRE3V50	NL50-3		ML50-3	MMT-350	TE-1057
C5	6	3		XPP3V6	NL6-3	TAW4A6	ML6-6		TE-1084

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	DEWALD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	
C7	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C8	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	
C9	4.7			NP0-S14.7	TCZ-4R7	TZ07	TCO-4.7	ZT-5547	5TCCB-V47	
C10	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	
C11	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	
C12	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C13	5000			BPD-005	DD-502	K080	ED-005	DC525	5HK-D5	Note 1
C14	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	

Note 1: Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DEWALD PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	10K	½	V311-1					Volume & Switch

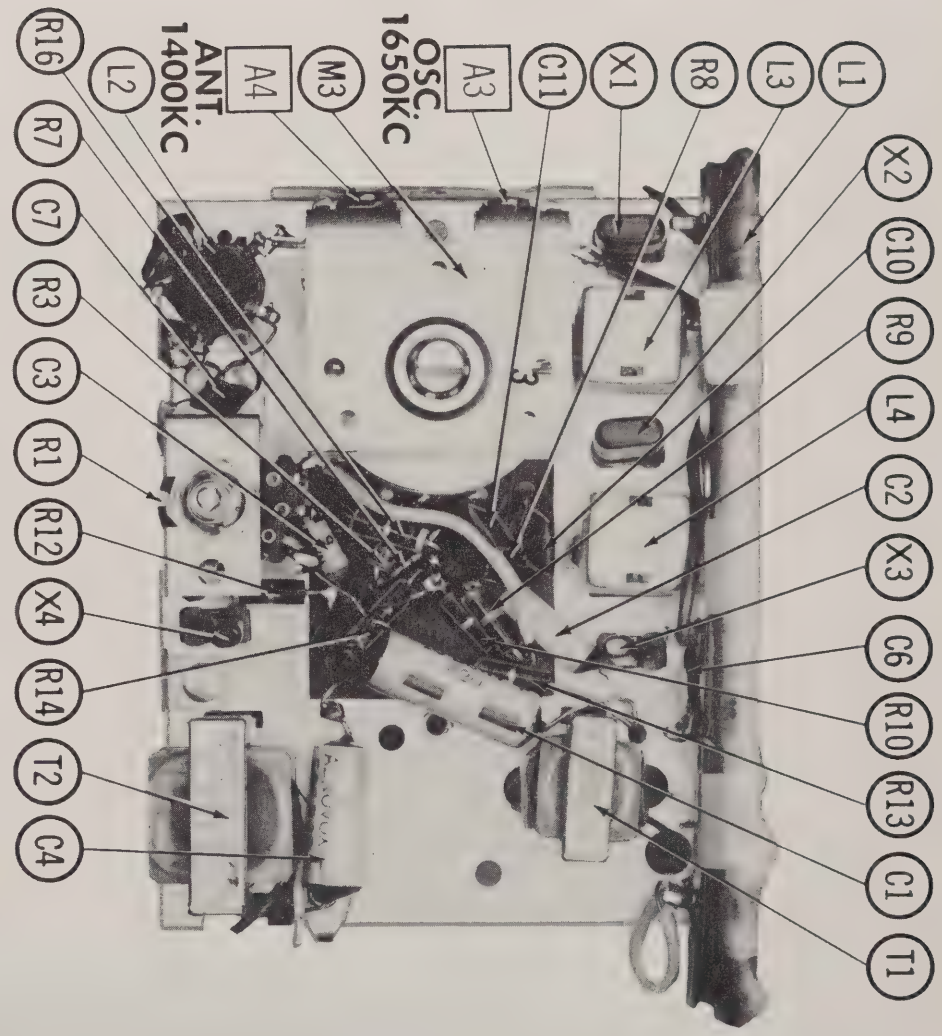
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DEWALD PART No.	IRC PART No.	
R2	18K			BTS-18K	
R3	33K			BTS-33K	
R4	4700Ω			BTS-4700	
R5	1000Ω			BTS-1000	
R6	1000Ω			BTS-1000	
R7	1000Ω			BTS-1000	
R8	1000Ω			BTS-1000	
R9	10K			BTS-10K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DEWALD PART No.	IRC PART No.	
R10	150K			BTS-150K	
R11	27K			BTS-27K	
R12	4700Ω			BTS-4700	
R13	1000Ω			BTS-1000	
R14	4300Ω 5%			BTS-4300 5%	
R15	560Ω			BTS-560	
R16	470Ω			BTS-470	
R17	82Ω			BTS-82	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	RESISTANCE PRI.	RESISTANCE SEC.	REPLACEMENT DATA: DEWALD PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	865Ω	120Ω	T135A-1				TR-13		
	Turns Ratio 4 : 1								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: DEWALD PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	1200Ω	17Ω	T136A-1				TR-32		

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA: DEWALD PART No.	QUAM PART No.	NOTES
SP1	2 3/4"	PM	17Ω	S-712		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: DEWALD PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Stick	L-138A	14-9013			
L2	Osc. Coil	O-137	14-9014			
L3	1st IF Trans.	1-131-3	16-9012		2041	
L4	2nd IF Trans.	1-131-4	16-9013		2041	

BATTERIES

ITEM No.	VOLTAGE	DEWALD PART No.	REPLACEMENT DATA: EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M1	9V			246			2N6		

CRYSTAL DIODES

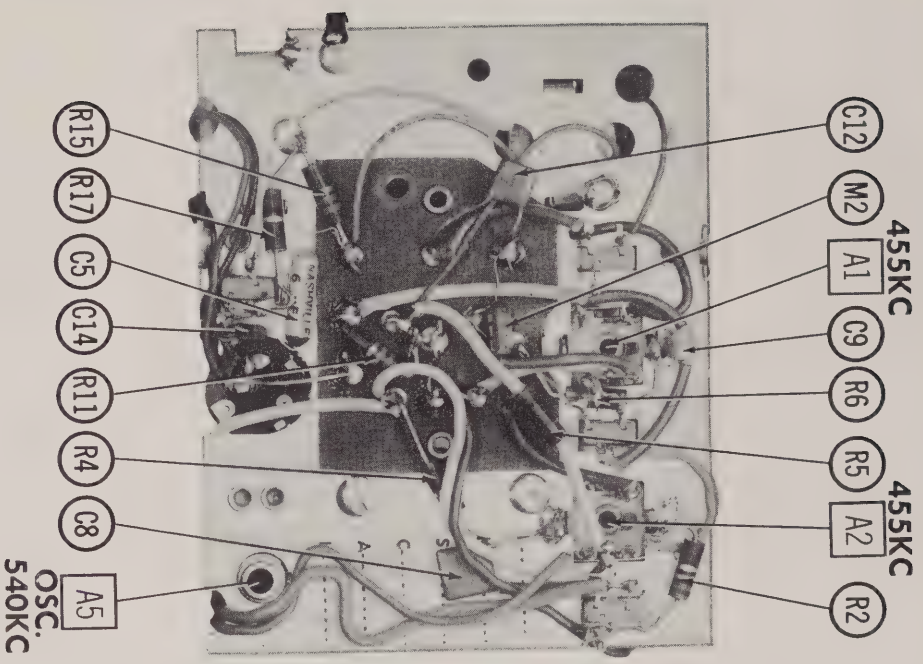
ITEM No.	ORIG. TYPE	REPLACEMENT DATA: DEWALD PART No.	SYLVANIA PART No.	NOTES
M2	*1N295		1N60	Pigtail (Audio Detector)

* CK-706A may be used in some versions.

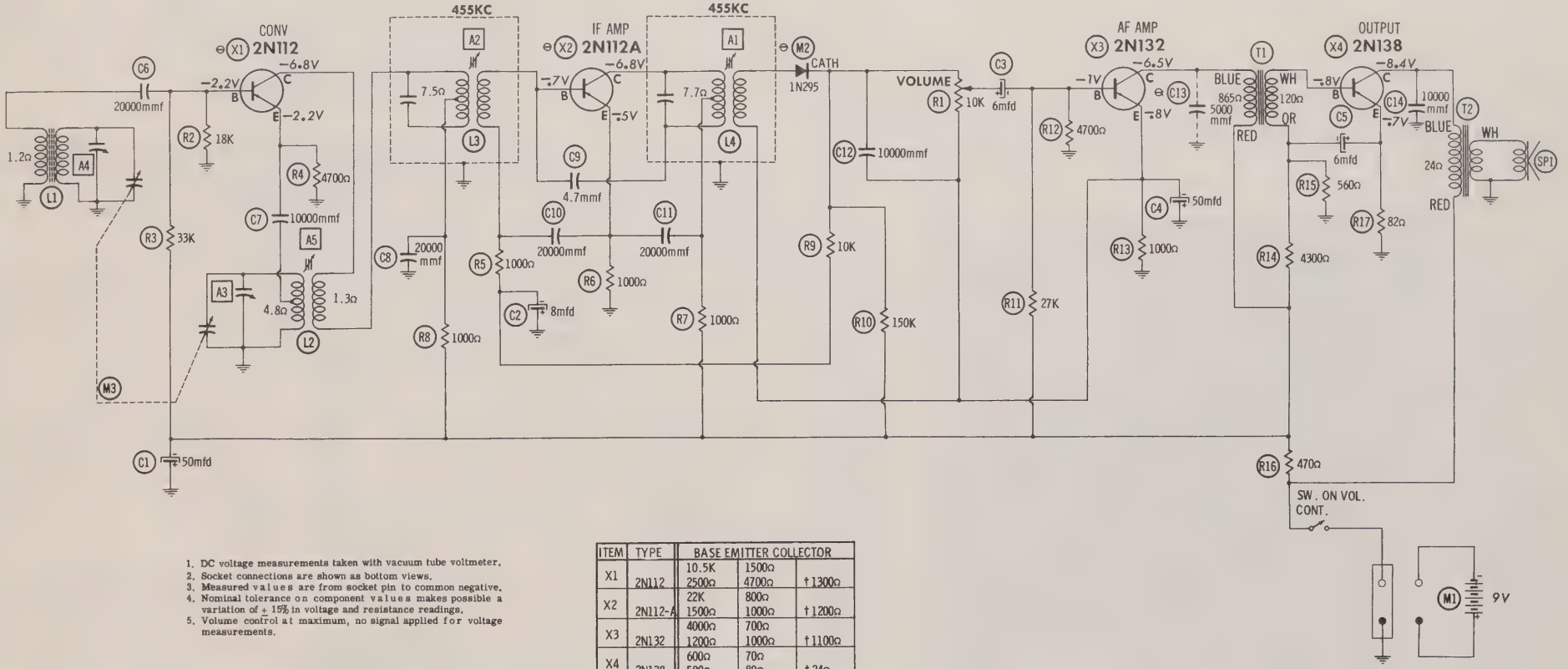
MISCELLANEOUS

ITEM No.	PART NAME	DEWALD PART No.	NOTES
M3	Tuning Cap.	C-219-1	2 Gang (10-135MMF, 18-100MMF)
	Cabinet	C-445A	
	Knob	K-447	Volume
	Knob	K-448A	Tuning

CHASSIS—BOTTOM VIEW



DEWALD MODEL K-544



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N112	10.5K 2500Ω	1500Ω 4700Ω	†1300Ω
X2	2N112-A	22K 1500Ω	800Ω 1000Ω	†1200Ω
X3	2N132	4000Ω 1200Ω	700Ω 1000Ω	†1100Ω
X4	2N138	600Ω 500Ω	70Ω 80Ω	†24Ω

DUAL READINGS INDICATE REVERSAL OF METER LEADS.
† MEASURED FROM JUNCTION OF R16 AND ON-OFF SWITCH.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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MODEL 250 ▶

◀ MODEL 260

EKOTAPE MODELS 250, 251, 252, 253, 254, 255, 260, 261

EKOTAPE MODELS 250, 251, 252, 253, 254, 255, 260, 261

GENERAL INFORMATION

The Webster Electric Ekotape Recorder Models 250, 251, 260, and 261 are housed in portable cases, while Models 252, 253, 254, and 255 are cabinet models. All are twin-track, two speed-models, operating at tape speeds of either 3 3/4 or 7 1/2 inches per second.

The Ekotape recorders are designed to record and play-back two tracks of material on standard recording tape with no loss of frequency response or quality. Recordings can be made from a radio, television receiver or phonograph, in addition to those made directly from the microphone. Recordings can be played through the self-contained speakers or an external speaker may be used through use of the jack labeled "Spkr."

PROPERTY OF

Using both channels of the tape, the recording time is as follows:

Reel Size	3 3/4" Speed	7 1/2" Speed
5" (600 ft.)	1 hour	1/2 hour
7" (1200 ft.)	2 hours	1 hour

CAUTION: Severe Damage Will Result If Connection Is Made To A Direct Current (DC) Line.

Manufactured by:

Webster Electric Company
Racine, Wisconsin

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1. SPECIFICATIONS

Model	Volts - Cycles	Model	Volts - Cycles
250	117VAC, 60~	254	117VAC, 60~
251	115/230VAC, 50~	255	115/230VAC, 50~
252	117VAC, 60~	260	117VAC, 60~
253	115/230VAC, 50~	261	115/230VAC, 50~

2. DESCRIPTION OF MODELS.

All models covered by this bulletin are similar in basic design and construction. All are twin-track, two-speed recorders, operated at 3 3/4 or 7 1/2 inches per second tape speed, using Class A amplifiers.

Models 250, 251, 260, and 261 are housed in portable cases, while Models 252, 253, 254, and 255 are cabinet models. Each model is equipped with a control knob for remote starting and stopping of the mechanism, and a counter for indicating the length of tape wound on the take-up reel. The 250 series recorders are equipped with separate equalization networks for each speed, while the 260 series has one network designed for compromise performance at both speeds. The 250 series recorders have a muting switch for silencing the speakers during fast forward and rewind.

3. OPERATING INSTRUCTIONS

To Make A Recording-

1. After the recording tape has been properly threaded, turn the "On-Off-Tone" Control to the "On" position.

2. Turn the mechanism control knob (2) to "Forward".

3. Turn the "Record-Listen" selector knob to the "Record" position.

NOTE: The "Record-Listen" selector knob will stay in the "Record" position only when the mechanism control knob (2) is in the "Forward" position.

4. Turn the "Volume" control clockwise until the incoming signal causes the "Record Indicator to flicker occasionally. A recording is now being made on the tape.

To Record From Microphone-

1. Insert the microphone plug into the "Mic" jack, located on the left side of the top panel.

2. Follow the instructions under the heading of, "To Make A Recording".

3. Best results will be obtained if the microphone is kept closer to the source of sound than to any walls in the recording area to prevent echos of the sounds as they rebound off the walls.

NOTE: The microphone should be kept at least three feet away from the loudspeaker during recording unless the "Speaker" control knob is in "Off" position.

To Record From Radio Or Television Receiver-

Recordings can be made from a radio or television receiver by placing the microphone near the loudspeaker; however, this type of recording may not be satisfactory as other sounds may be picked up by the microphone which as a result may be recorded on the tape. A superior quality recording can be made use of Radio Cord Attachment accessory. Connect attachment cord as follows:

1. Connect the cord clips across the voice coil terminals on the radio or television speaker.

2. Insert the cord plug into the "Phono-Radio" input jack located on the left side of the top panel.

3. Set the radio or television receiver for soft playing, then operate the recorder controls as described under "To Make A Recording".

To Record From Phonograph-

1. Connect the alligator clips of the Radio Cord Attachment to the ends of the pickup leads of the phonograph and then insert the cord plug into the "Radio-Phono" jack. Proceed with the recordings as described under "To Make A Recording".

NOTE: Should a hum develop from the above connections, reverse the cord clips on the pickup leads.

To Play A Recording-

1. With the tape properly threaded, turn the mechanism control knob (2) to the "Forward" position.

2. Adjust the "Volume" and "Tone" controls to suit.

3. Be sure the speaker "On-Off" switch located on the right side of the top panel, is in the "On" position.

Fast Forward-

If it is desired to reach a recording near the end of a tape in a few seconds, turn mechanism control knob (2) to the "Fast Forward" position. In the "Fast Forward" position the tape moves ahead approximately 15 times normal listening speed of 3 3/4 or 7 1/2 inches per second. The most rapid fast forward speed is therefore obtained with the speed control set at 7 1/2.

To Rewind-

Turn the mechanism control knob (2) counter-clockwise into the "Rewind" position. When the rewinding is completed move the mechanism control knob (2) into "Stop" position and allow the tape to come to a complete stop before moving the mechanism control knob to any other function.

Twin Track Operation -

The Series 250 and 260 or twin track units, which records on approximately half the width of the tape at one time.

1. To record a second program on the same tape, lift the full reel from the right hand spindle, turn it over, and place it on the left hand spindle.
2. Place an empty reel on the right hand spindle; properly thread the tape, and continue your recording as described under "To Make A Recording".

To Edit and Splice Tape -

NOTE: Since it is impossible to edit and splice one track without affecting the other, recordings which are to be edited should be limited to one track only.

1, The tape may be edited by cutting out unwanted portions, or by joining selections into another sequence. Announcements may be inserted between selections, etc. Unused sections of tape can be spliced together for re-use.
2. For best results, cut tape at a slight diagonal, join ends together with splicing tape on the glossy side and trim off any excessive width.

Tape Counter -

1. The tape counter on the 260 Series registors "000" to "999" and will save much guesswork when trying to locate a desired portion of a pre-record tape. The reading of the counter may be noted as the recording is being made so that reference to any given point on the tape may be made very rapidly. When a recording tape has been so logged or referenced, always "zero" the counter before starting to play the recording. This should be done before tape is threaded on the take-up reel. Turn the mechanism control knob to "Forward" and observe the counter. Move the mechanism control knob to the "Stop" position when approaching "000" and then the last few digits can be turned off manually by spinning the take-up reel with the fingers. The tape counter on the 250 Series is of the dial type, and can be used in a similar manner as the above counter.

4. DISASSEMBLY INSTRUCTIONS.

All service work will require removal of the unit from its carrying case with the following exceptions:

Cleaning and aligning of the head assembly (30), cleaning, adjustment or replacement of the brake lever assemblies (45) and (54), remote lever assemblies (51), pinch roller and lever assemblies (22), and the pressure pad assembly (28).

a. See Exploded View - Page 8. Remove record head cover (9) by removing screw (8), then lift the cover out of place on the panel.

b. For cleaning of the head (30), and inspection of the pressure pad assembly (28), remove all six control knobs and counter knob (7); remove screws (6) which hold plastic cover (5) to the top panel and remove the plastic cover from its position.

NOTE: On 250 series recorders,. the plastic cover and top panel are a semi-permanent assembly, and unless either are to be replaced, no attempt to separate them should be made.

c. To remove top panel (13), follow procedure outlined in "b" above and remove the seven screws (14). Lift panel straight up and off.

d. To remove the unit from its case, remove the four screws located on both ends of the unit. Turn the recorder up in a vertical position so that the speaker grille faces upward, and carefully remove the unit from the case. After the unit is part way out of the case disconnect the speaker plug, then remove the unit entirely from the case.

e. To gain access to the internal wiring and components of the amplifier, remove the chassis bottom cover after following procedure given in "d" above to remove unit from case. It is not necessary to remove the top panel or plastic cover in order to check the amplifier.

f. After servicing the unit, inspect visually for signs of damage and wear, and make certain all parts are in their proper place and properly adjusted. Reassemble by reversing the procedure outlined above. When returning the unit to the case be sure that speaker leads will be clear of all moving parts.

5. CLEANING.

When improper operation of the unit calls for cleaning as indicated by the Trouble Chart, follow the procedures outlined below:

a. When trouble is caused by dirt on the head (30), clean the head with a soft, dry cloth. If dirt is thick and caked on the head, moisten the cloth with carbon tetrachloride or another suitable solvent, and rub gently until the dirt is removed.

NOTE: Do not use a brush or an excessive amount of solvent to clean the head.

b. See Exploded View. The flywheel and shaft assembly (89), pinch roller assembly (18), and the two tape guide spacers (33), may be cleaned in the same manner as described in "a" above.

c. If pressure pad assembly (28) has dirt on the pads, brush lightly with a stiff fibre brush. If caked with dirt, worn, or hard, replace the assembly.

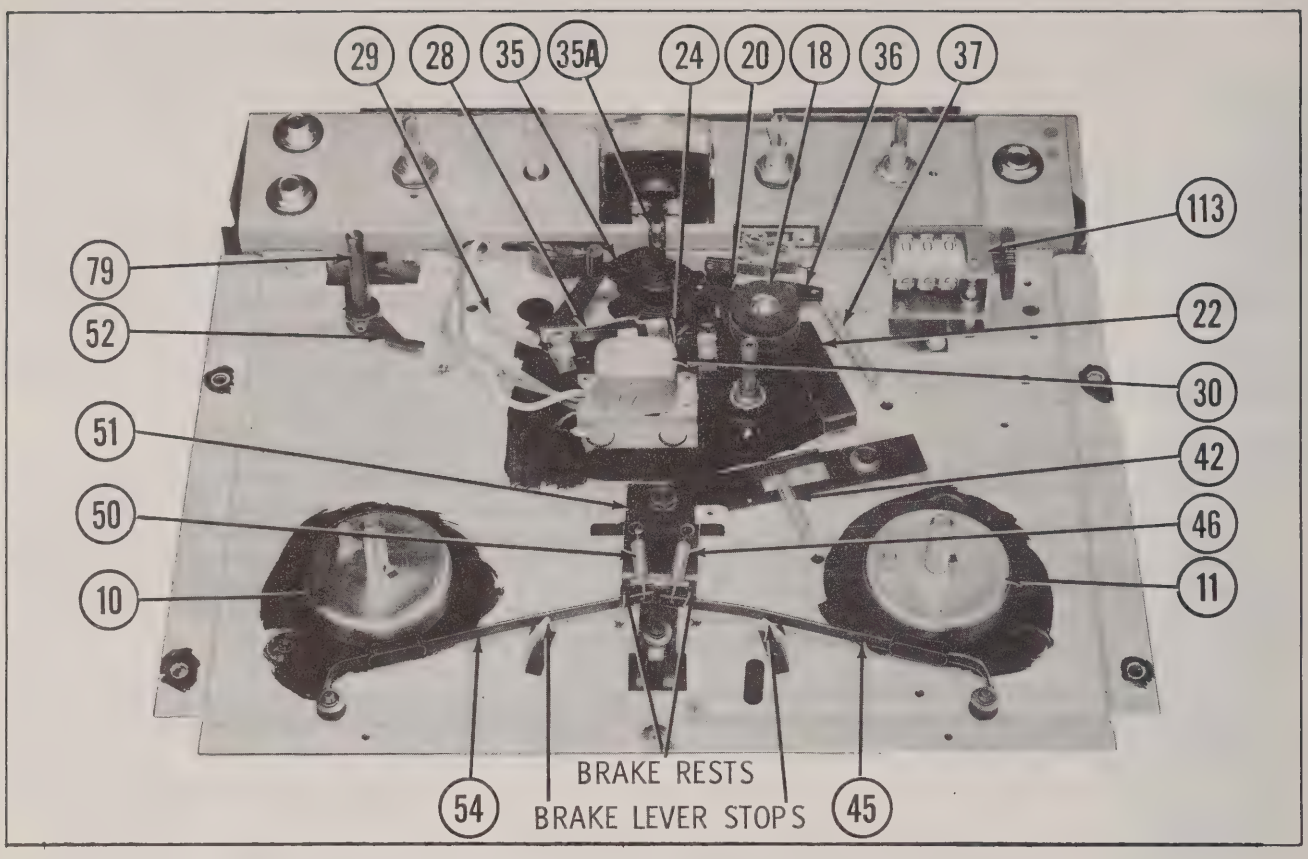


FIGURE 1. TOP VIEW OF MODEL 250 WITH TOP PANEL REMOVED

6. LUBRICATION

GREASE SHALL BE APPLIED SPARINGLY. Only a thin film of grease is required in all cases. Remove dirty and excessive grease with carbon tetrachloride or another suitable solvent before re-lubrication.

a. Oilite bearings are pre-lubricated for the life of the bearing. All that is necessary is light wiping with a clean rag. No further lubrication of the bearings is required.

CAUTION: Never use a cleaning solvent on oilite bearings. Any excess oil may run off the bearings and work its way onto the rubber driving surfaces, causing unsatisfactory operation of the mechanism.

b. Lubricate all cams, levers and sliding parts with a thin film of Liqui - Moly NV Grease.

7. TESTING, ADJUSTMENTS, REPAIR, AND REMOVAL.

Use the procedures outlined below to bring the equipment to peak operating efficiency after repair and overhaul or during trouble shooting services.

8. RECORD-ERASE HEAD AND OSCILLATOR ADJUSTMENT.

To test the oscillator, refer to the circuitry in the schematic diagram of the model to be tested. Use an AC vacuum tube voltmeter and measure for rated voltages at the points shown in the schematic. If the tests indicate trouble in the record-erase head, replace it in the following manner.

a. Remove three screws and washers attaching the head assembly to the mechanism plate and lift off the head. Remove the record and erase leads from the head terminal pins with care.

b. When installing a new head, make connection of record and erase leads to the terminal pins as indicated in Figure 2. The ground lead terminal lug should be attached to the chassis with one of the head mounting screws, preferably between the screw head and the washer, so as to insure contact with ground. Tighten the three mounting screws down so there is a slight pressure on the mounting grommets. Thread the unit with tape and adjust the front screw on the head so that tape and pressure pad assembly (28) engage the groove

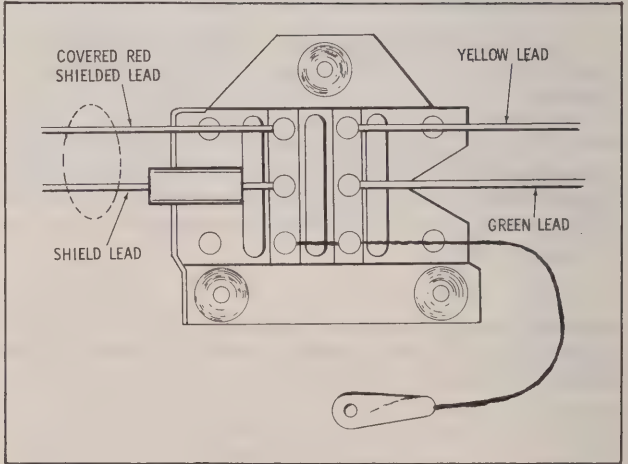


FIGURE 2. BOTTOM VIEW OF HEAD

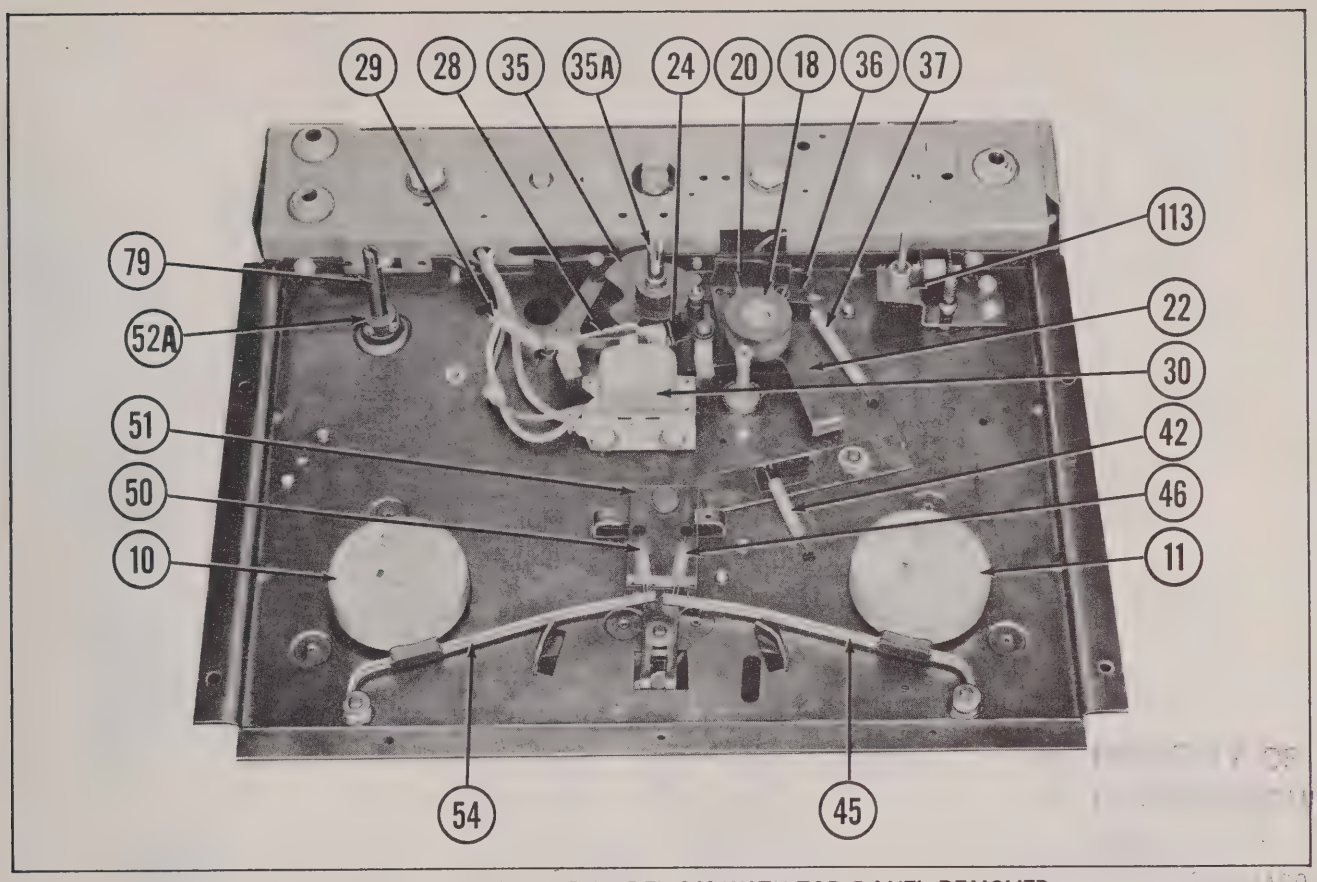


FIGURE 3. TOP VIEW OF MODEL 260 WITH TOP PANEL REMOVED

of the head properly. Adjust the two screws on the back of the head for maximum output using a constant frequency tape of 7500 cycles at 7 1/2 inches per second if available. This same tape may be used at 3 3/4 inches per second to provide a 3750 cycle alignment signal. If not available, use a previously recorded tape and align head for maximum output of high frequency response with the tone control turned to full clockwise position.

9. PRESSURE PAD AND LEVER ADJUSTMENTS.

Pressure pad and lever assembly (28) should be cleaned (paragraph 5c), adjusted or replaced in the following manner:

a. To adjust pressure pad assembly (28), remove plastic cover and top panel as covered in paragraphs 4b and 4c.

b. To remove assembly for cleaning, repair or adjustment, remove spring (29) and retaining ring (27), Rotate the pressure pad assembly slightly counter clockwise and lift it off.

c. Reassemble in reverse order and re-lubricate per paragraph 6.

d. Adjust by turning knob (2) to "Forward" position and check to be sure pads engage groove of head properly. If not, bend levers as required.

NOTE: Be sure the face of the felt pads press against the erase and record pole pieces.

10. PINCH ROLLER ADJUSTMENT.

If pinch roller (18) is damaged or out of adjustment, replace, clean, and adjust in the following manner:

a. Remove the plastic cover (5) and top panel (13) as covered in paragraphs 4b and 4c.

b. Remove springs (20) and (24), and retaining ring (21).

c. Remove both assemblies (22) and (23) and shaft attached to mechanism plate.

d. Clean thoroughly, removing old grease and dirt, and re-lubricate (see paragraph 6). Reassemble in reverse order.

e. Adjust tab on follower lever assembly (23) so pinch roller assembly (18) engages the flywheel shaft just before brake lever assembly (54) releases supply reel pulley (10) from stop position to forward, thereby preventing flare out of the tape on the supply reel.

11. IMPROPER REWIND OPERATION.

If the equipment does not perform properly in rewind position, check as follows:

a. A damaged or worn motor pulley (94) may be the cause of improper rewind. To replace a damaged motor pulley assembly (94), remove unit from case as described in paragraph 4d. Unhook springs (74) and (75), unsolder the two motor leads and remove the three mounting screws and washers from the motor mounting plate (103). Carefully remove the assembly

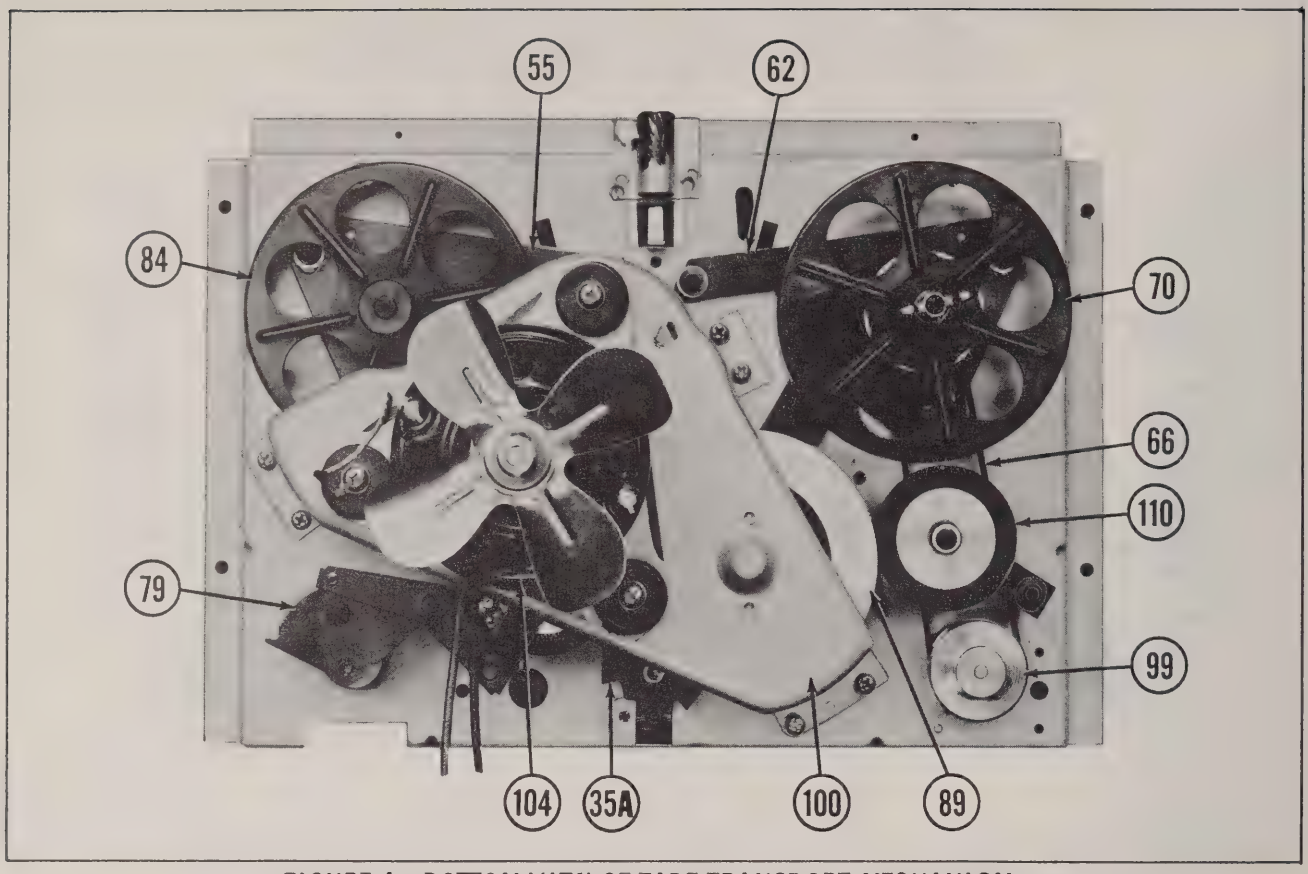


FIGURE 4. BOTTOM VIEW OF TAPE TRANSPORT MECHANISM.

so as not to damage the drive idler assemblies (76) and (86). Loosen the two Allen head set screws (97) and remove the motor pulley assembly. Reassemble with a new pulley in reverse order.

b. A worn, damaged or dirty supply reel shaft support assembly (55) may be responsible for improper rewind. To correct faulty operation, remove the unit from the case as described in paragraph 4d. Unsolder the motor leads. Unhook the two drive idler springs (74) and (75) from the support plate assembly (100). Remove the motor and plate assembly as described in paragraph 11a above. Loosen the two Allen head set screws (85) on the reel pulley assembly (84) to permit removal of the pulley. Pull out the reel shaft assembly (10). Unhook the spring (60) on the reel shaft support assembly (55), and remove the retaining rings (58), spring tension washers (57), and flat washers (56). This will free the reel shaft support assembly. Clean, repair or replace any damaged or worn parts before reassembly. See paragraph 6 for lubrication.

12. ADJUSTING BRAKE LEVER ASSEMBLIES.

a. If tape overruns from rewind to stop position, remove plastic cover and top panel as described in paragraph 4b and 4c. Turn cam and shaft assembly (35A) to rewind position (counter-clockwise as far as possible). Adjust the right brake lever assembly (45) so that the brake cup on reel shaft assembly (11) clears the brake lever pad by 1/64 inch maximum. Adjustment is made by bending the brake lever assembly (54) near the bent portion. Refer to Figure 1. Next, turn the cam and shaft assembly (35A) from rewind to stop position, observing that the reel brake cup compresses the brake lever pad about 1/64 inch while midway between the two positions. Compression adjustment may be made by bending the brake lever stop on the mechanism panel. When the unit is in the stop position, clearance must exist between brake lever assembly (54), the brake rests located on the remote lever assembly (51) and the brake lever stops located on the mechanism panel.

b. If tape overruns from fast forward to forward, check operation of left brake lever assembly (54) as explained in paragraph 12a, except with the cam and shaft assembly (35A) turned to the fast forward position (clockwise as far as possible).

13. CORRECTING TAKE-UP AND FAST FORWARD TROUBLES.

If the take-up or fast-forward drive does not function properly, remove unit from case (paragraph 4d), and consult exploded view . Check as follows:

a. If take-up or fast forward drive is weak, screw the self locking wing nut (73) so the reel shaft will not slip relative to the reel pulley assembly (70) with less than 4 inch-ounces torque.

b. If weak drive persists after the above adjustments, remove the self-locking wing nut (73), spring (72), washer (71), fibre washer (65), and reel pulley assembly (70). Check the felt pad on pulley assembly (70). If the pad is badly worn, replace the reel pulley assembly (70), but if pad shows no excessive wear, remove retaining ring (69B), and clutch disk (69A). Check to see if drive pin (69) is properly seated. Now, check U shaped washer (68) to see that it is not damaged. The washer should have an overall height of 3/32 inch. If at fault repair or replace washer. If pin (69) is worn or damaged, replace. Oil reel pulley assembly (70) slightly (see paragraph 6a) and reassemble. Adjust wing nut (73) to give a torque load on the reel shaft (11) of 4-5 inch-ounces.

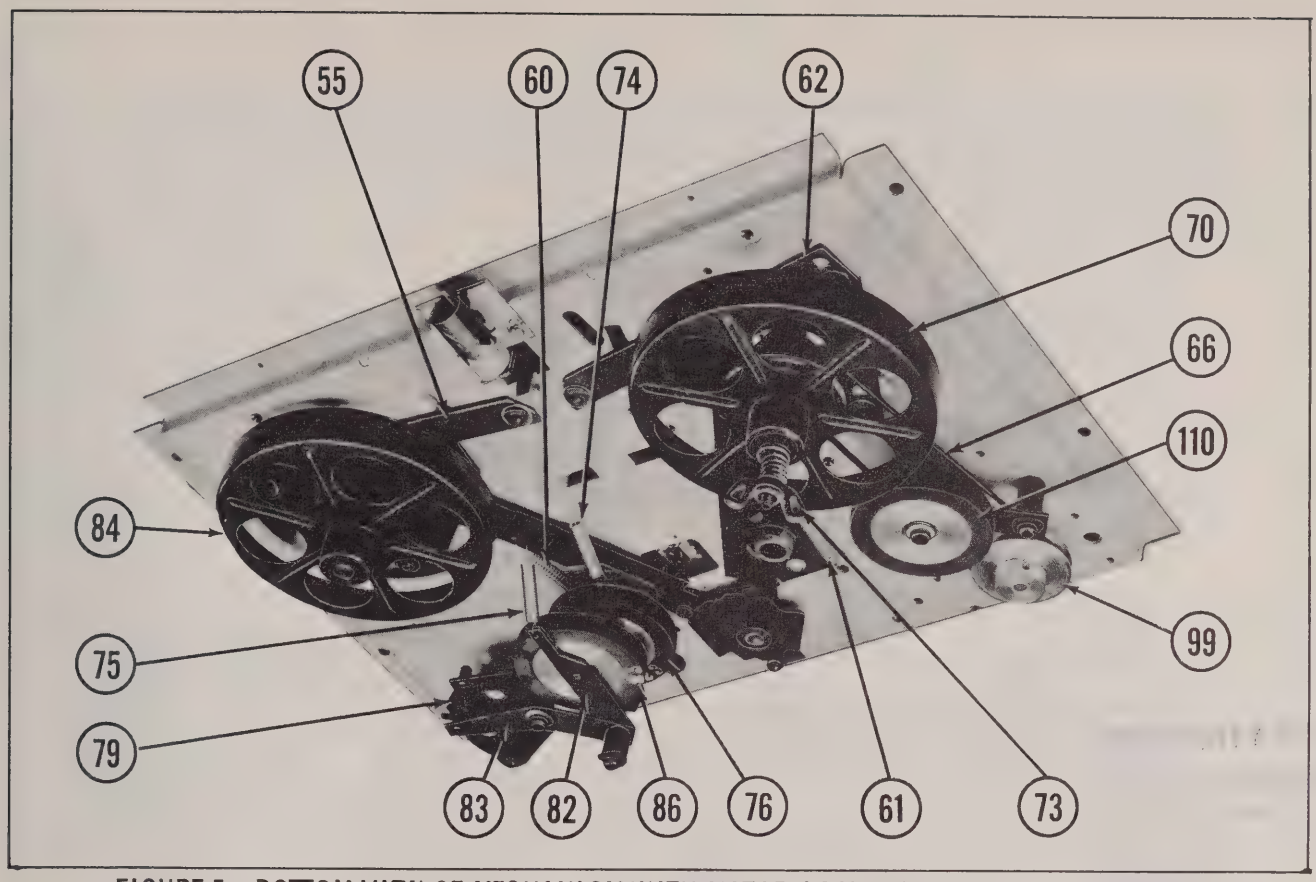


FIGURE 5. BOTTOM VIEW OF MECHANISM WITH MOTOR ASS'Y. AND FLYWHEEL REMOVED

c. Excessive noise in forward or fast forward position indicates a dirty or damaged idler assembly (110), or dirty bearings on the takeup shaft or pulley assembly. To check, remove unit from case (paragraph 4d), and inspect idler assembly and determine if dirty or damaged. Clean any dirt from idler tire and bearing. Clean flywheel and shaft assembly (89), reel pulley assembly (70), drive area only, with a suitable solvent (see paragraph 5). Re-lubricate as necessary (see paragraph 6).

d. If noise still exists and corrective measure 13c has been exercised, check reel shaft assembly (11). To disassemble follow procedure outlined in paragraph 13b and in addition remove pulley (67), retaining ring (64), fibre washer (63) and reel shaft assembly (11) and fibre washer (12). Clean and inspect all parts for wear or damage. Clean the bearing in reel shaft support assembly (62) and inspect bearing. Re-lubricate (paragraph 6), replace any damaged parts and re-assemble in order shown in Figure 6B.

14. REMOTE CONTROL INOPERATIVE.

To correct an improperly functioning remote lever assembly (51), disassemble the unit as covered in paragraphs 4b and 4c. Clean, repair and adjust as follows:

a. Remove the retaining rings and washers that are used to mount the lever assembly. Detach springs (42), (46), and (50) and remove lever assembly. Clean and lubricate (see paragraph 6) and reassemble.

b. If pinch roller assembly (18) does not engage the flywheel and shaft assembly (89) with remote lever assembly (51) in running position, or does not disengage flywheel and shaft assembly when remote lever is in stop position, adjust tab in which spring (42) is hooked so that the remote lever, when actuated to the stop position causes the pinch roller to disengage the flywheel and shaft assembly with a clearance of 1/64 to 1/32 inch. Release remote lever assembly and make sure that the tab on the remote lever clears the pinch roller lever assembly (22).

15. SPEED SELECTOR OR EQUALIZER SWITCH INOPERATIVE.

a. If the speed selector is out of adjustment, disassemble equipment as covered in paragraphs 4b, c, and d, and clean, repair or replace as necessary. Broken or unhooked springs (74 or 75) on drive idler assemblies or cam shaft assembly (79) being out of adjustment would be the chief causes of faulty operation. Check to see that the follower pins on the ends of the lever and idler assemblies (80) and (83) drop into the recesses on the cam shaft assembly (79) when the shaft is turned to its two different positions. Adjustment is made by loosening the set screws in switch cam (52) and turning cam shaft assembly (79) as required.

b. Failure of the equalizer switch (Model 250 only) may be due to the switch cam assembly (52) being loose on the cam shaft assembly (79). To adjust, turn cam shaft assembly to off position and set arms of switch cam assembly (52) the same distance from the equalizer switch and tighten set screws in this position.

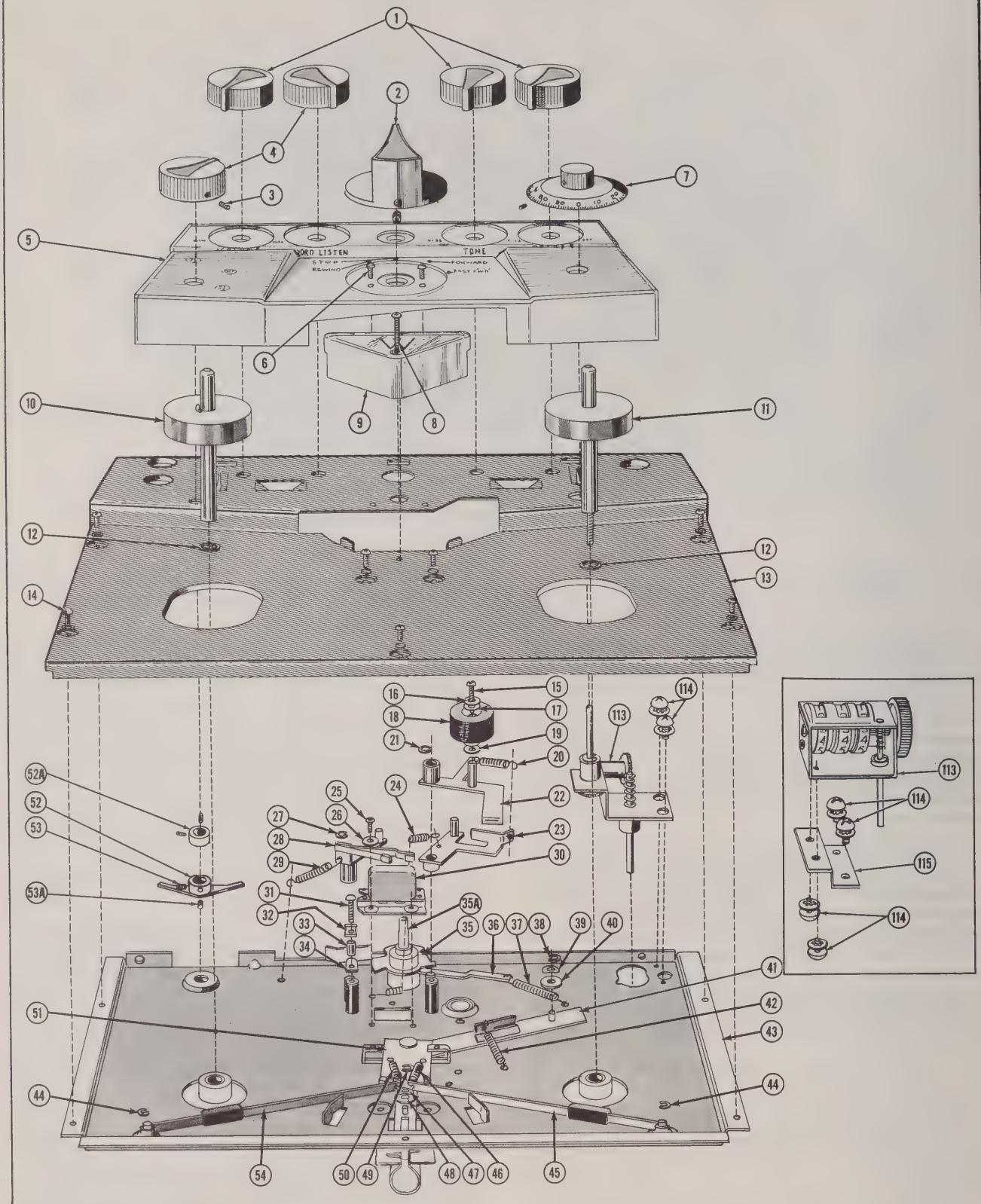


FIGURE 6A. EXPLODED VIEW OF PARTS ABOVE MECHANISM PLATE.

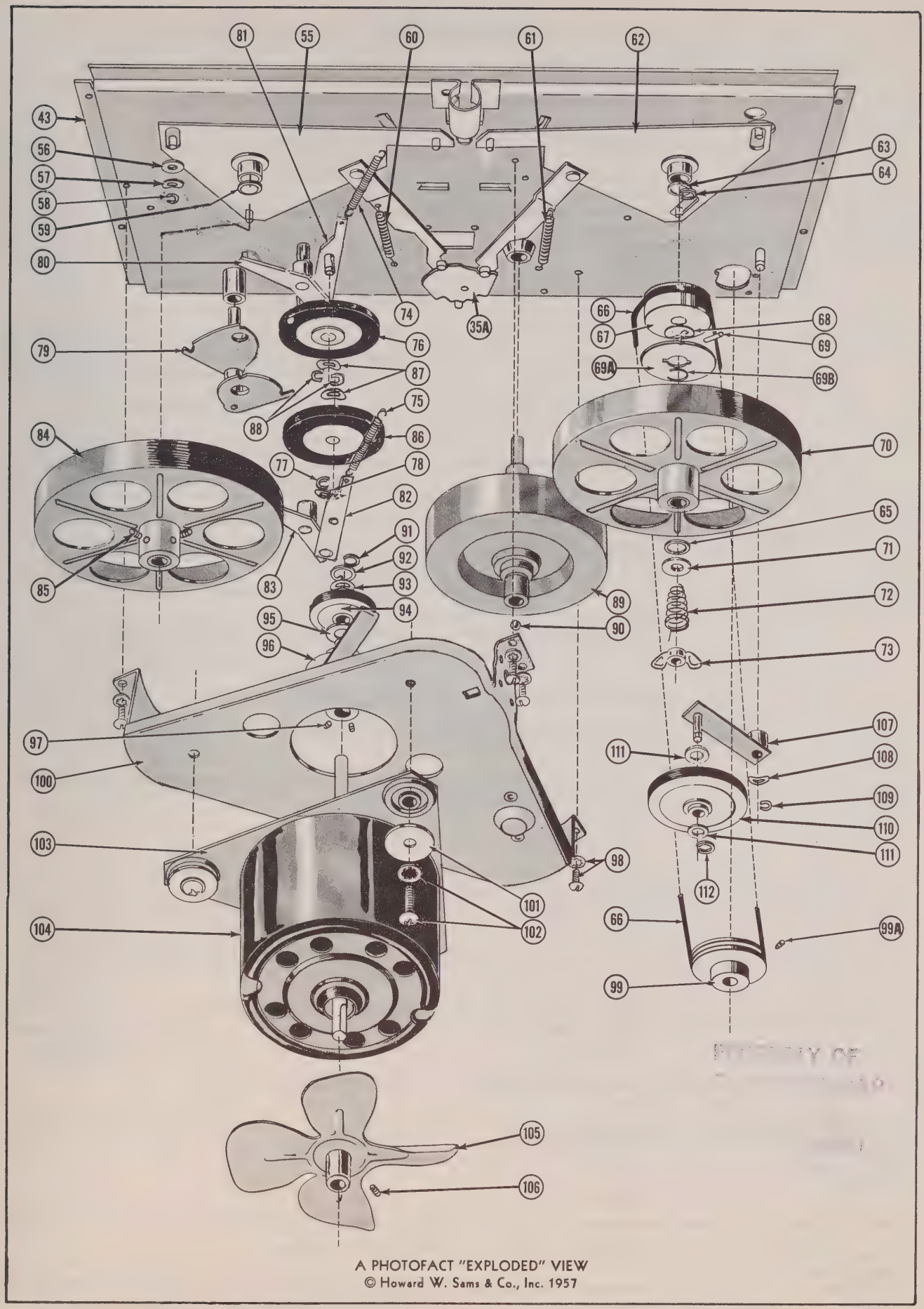


FIGURE 6B. EXPLODED VIEW OF PARTS BELOW MECHANISM PLATE.

TROUBLE CHART

TROUBLE	CAUSE	REMEDY
Motor and amplifier inoperative with switch on.	Power supply defect.	Check voltages per schematic.
	Damaged power cord.	Repair or replace.
	Broken tone control switch.	Replace switch.
Sound is fuzzy, faint, distorted, or no sound.	Over-recorded or under-recorded tape.	See owner guide for proper operation.
	Amplifier trouble.	See paragraph 4e.
	Pressure pads not operating properly.	See paragraph 9.
	Dirty head.	Clean. Do not remove or change position of head. (See paragraphs 4b and 5.)
	Worn or dirty pressure pads.	Clean or replace. (See paragraph 9.)
	Record head inoperative.	Check oscillator bias voltage and head continuity. (See paragraph 8.)
No sound but motor operates and tubes light.	Amplifier trouble.	See paragraph 4e.
	Open circuit to speaker.	Check speaker cable continuity.
Erase incomplete or no erase.	Dirty head.	Clean. (See paragraphs 4b and 5.)
	Oscillator not operating.	Check voltage from oscillator coil tap to ground with a-c vacuum tube voltmeter. Should be at least 45V.
	Damaged erase coil.	Check continuity.
	Pressure pads worn, damaged, or out of adjustment.	Adjust or replace. (See paragraph 9.)
Does not record.	Faulty microphone or cord.	Replace.
	Faulty input jack.	Check and replace.
	Faulty tube.	Check tubes.
	Low bias voltage.	Check voltage across full oscillator coil secondary winding with a-c vacuum tube voltmeter. Should be at least 180V.
	Dirty head.	Clean.
	Pressure pads worn, aged, or out of adjustment.	Adjust or replace. (See paragraph 9.)
	Open record-reproduce coil.	Check continuity.
Does not reproduce; amplifier hiss only.	Open record-reproduce coil.	Check continuity.
	Open input circuit.	Check circuit.
Howl or ringing sound during reproduction	Microphonic tube.	Replace bad tube.
	Acoustical feedback at recording.	Erase tape and re-record with speaker off, or move microphone away from speaker.

TROUBLE CHART Con't.

TROUBLE	CAUSE	REMEDY
Poor high frequency response.	Bad component in equalization network.	Check and replace.
	Poor contact on Record-Listen switch.	Replace switch.
	Bad feedback resistor.	Replace.
	Dirty head.	Clean. (See paragraphs 4b and 5.)
	Pressure pads worn, damaged or out of adjustment.	Adjust or replace. (See paragraph 9.)
Loud hum on reproduction.	Bad tone control switch.	Replace switch. (See paragraph 4b.)
	Open power supply filter capacitor.	Check and replace.
Recording unintelligible on playback.	Improper record bias.	Check oscillator circuit parts. Replace bad parts.
	Pressure pads worn, damaged or out of adjustment.	Adjust or replace. (See paragraph 9.)
	Malfunction in pre-amplifier circuit (5879 tube).	Check circuit components. Replace if necessary.
Distorted bass response.	Bad component in equalization network.	Replace as required.
Output muffled or low.	Dirty head.	Clean. (See paragraphs 4b and 5.)
	Bad amplifier coupling capacitor.	Locate and replace.
	Weak amplifier tube.	Replace.
	Bad microphone or cable.	Check, repair or replace.
Tape overruns from rewind to stop.	Damaged, worn or improperly adjusted take-up reel brake.	Check brakes. Repair, replace or adjust. (See paragraph 12a.)
Tape overruns from fast forward to forward.	Worn, damaged or improperly adjusted supply reel brake.	Check brakes. Repair, replace or adjust. (See paragraph 12b.)
Take-up or fast forward inoperative, noisy or irregular.	Worn or improperly adjusted clutch.	Repair, replace or adjust. (See paragraph 13.)
	Brakes dragging on supply reel.	Adjust brakes. (See paragraph 12a.)
	Take-up reel support dirty or damaged.	Clean and lubricate or replace as necessary.
	Worn or damaged idler.	Replace. (See paragraph 13c.)
	Take-up reel support plate spring broken.	Replace. (See Figure 5.)
Noisy operation in stop and forward positions.	Worn or damaged idlers or dry bearings.	Replace.
	Damaged idler link.	Repair.

TROUBLE CHART Con't.

TROUBLE	CAUSE	REMEDY
Tape flares out on supply reel when engaging remote lever assembly.	Worn or damaged supply reel brake, or broken spring.	Replace. (See paragraph 12.)
Remote lever assembly not functioning properly.	Broken return spring or dirty lever assembly.	Replace spring. (See paragraph 14.) Lubricate lever.
	Pinch roller does not disengage capstan.	Adjust lever assembly.
Inoperative control knob.	Loose knob set screw.	Tighten.
	Loose set screw in pinch roller cam assembly.	Adjust cam to proper position and tighten.
Speed selector not functioning properly.	Broken springs on drive idler assemblies.	Replace. (See paragraph 15a.)
Unit inoperative when control knob is operated.	Loose control cam.	Adjust and tighten.
	Damaged or worn cam and shaft assembly.	Replace.
Poor equalization in either or both speeds.	Switch cam assembly loose (Model 250).	Adjust. (See paragraph 15b.)
	Bad equalization switch (Model 250).	Replace. (See paragraph 15b.)
	Bad equalization circuit component.	Replace.
Counter inoperative.	Broken belt (66).	Replace belt.
Pilot light out, all other operation normal.	Bad pilot lamp.	Replace pilot lamp.
"Monkey chatter" on Model 250 in fast-forward or rewind.	Bad muting switch.	Replace.
	Muting switch tab bent.	Adjust.
No output.	Bad closed circuit speaker jack.	Check speaker jack. Repair or replace as necessary.
	Bad speaker on-off switch.	Check switch. Repair or replace as necessary.
	Bad muting switch on Model 250.	Check muting switch. Repair or replace as necessary.
"Wow" during operation of recorder.	Dragging brake.	Check brake and correct if bad.
	Clutch too tight.	Adjust.
	Oil on drive surface.	Check drive surface and clean per paragraph 5.
"Flutter" during operation.	Dirty head, pressure pads, flywheel and shaft assembly, or pinch roller.	Clean per paragraph 5.

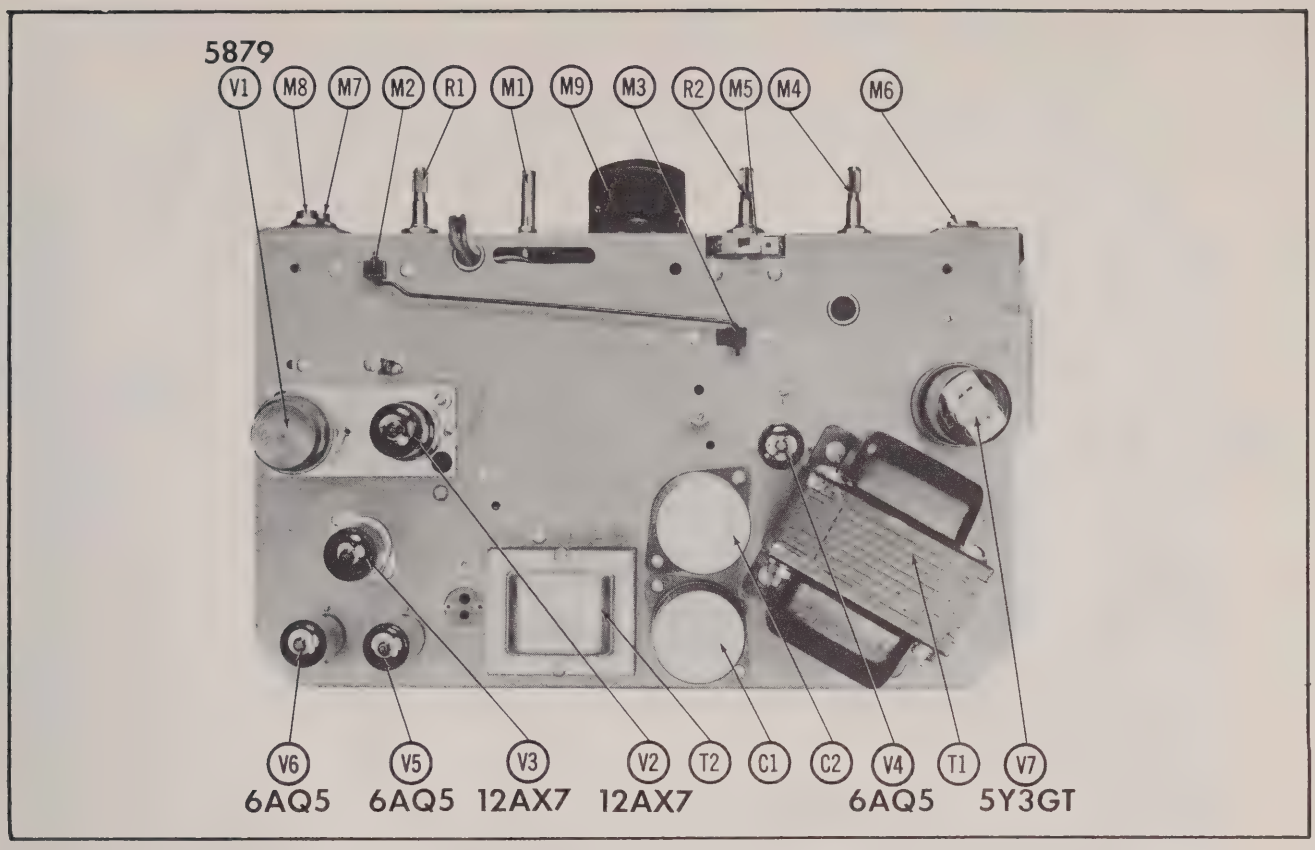


FIGURE 7. FRONT VIEW OF MODEL 250 AMPLIFIER ASSEMBLY.

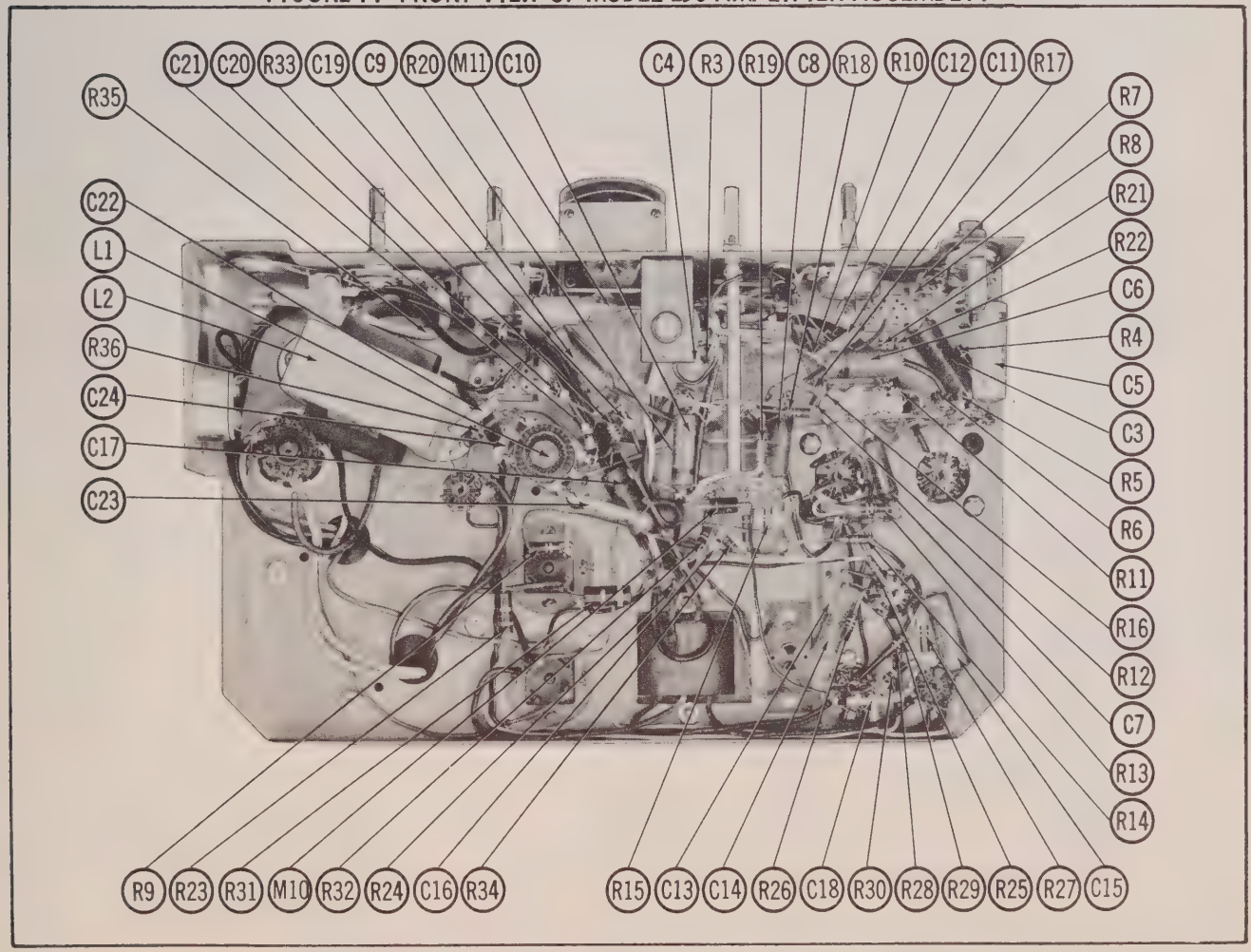
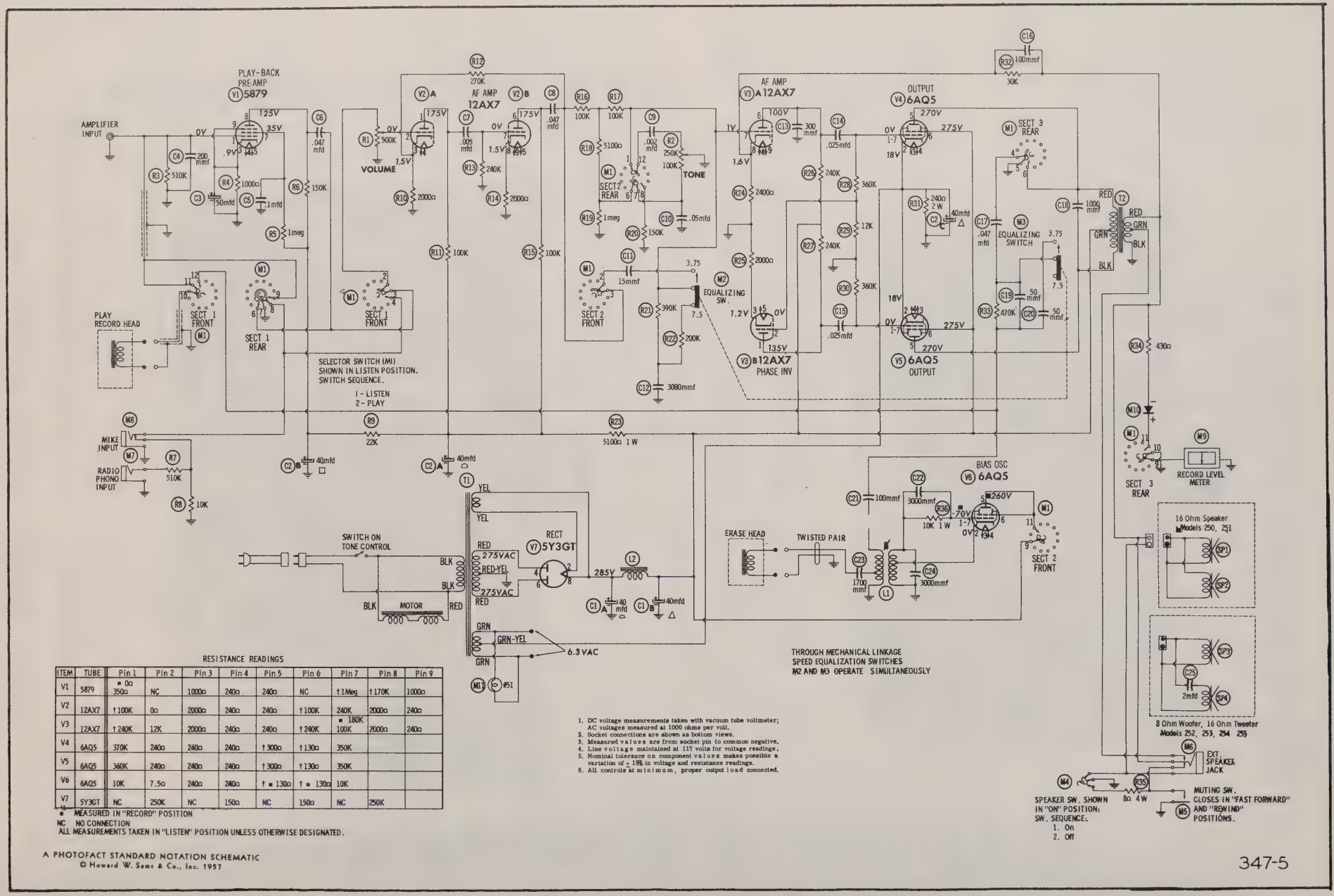


FIGURE 8. REAR VIEW OF MODEL 250 AMPLIFIER ASSEMBLY.


PLAY-BACK PRE-AMP V1 5879
AF AMP 12AX7 V2A V2B
AF AMP V3A 12AX7
OUTPUT V4 6AQ5
V3B 12AX7 PHASE INV
V5 6AQ5 OUTPUT
BIAS OSC V6 6AQ5
RECT V7 5Y3GT
AMPLIFIER INPUT
VOLUME
TONE
EQUALIZING SW.
EQUALIZING SWITCH
PLAY RECORD HEAD
SECT 1 FRONT
SECT 1 REAR
SECT 2 FRONT
SECT 3 REAR
SELECTOR SWITCH (M1) SHOWN IN LISTEN POSITION. SWITCH SEQUENCE.
1 - LISTEN
2 - PLAY
MIKE INPUT
RADIO PHONO INPUT
SWITCH ON TONE CONTROL
MOTOR
ERASE HEAD
TWISTED PAIR
RECORD LEVEL METER
16 Ohm Speaker Models 250, 251
8 Ohm Woofer, 16 Ohm Tweeter Models 252, 253, 254 255
EXT. SPEAKER JACK
MUTING SW. CLOSES IN "FAST FORWARD" AND "REWIND" POSITIONS.
SPEAKER SW. SHOWN IN "ON" POSITION: SW. SEQUENCE. 1. On 2. Off
THROUGH MECHANICAL LINKAGE SPEED EQUALIZATION SWITCHES M2 AND M3 OPERATE SIMULTANEOUSLY

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	5879	■ 0Ω 350Ω	NC	1000Ω	240Ω	240Ω	NC	↑1Meg	↑170K	1000Ω
V2	12AX7	↑100K	0Ω	2000Ω	240Ω	240Ω	↑100K	240K	2000Ω	240Ω
V3	12AX7	↑240K	12K	2000Ω	240Ω	240Ω	↑240K	■ 180K 100K	2000Ω	240Ω
V4	6AQ5	370K	240Ω	240Ω	240Ω	↑300Ω	↑130Ω	350K		
V5	6AQ5	360K	240Ω	240Ω	240Ω	↑300Ω	↑130Ω	350K		
V6	6AQ5	10K	7.5Ω	240Ω	240Ω	↑ ■ 130Ω	↑ ■ 130Ω	10K		
V7	5Y3GT	NC	250K	NC	150Ω	NC	150Ω	NC	250K	

■ MEASURED IN "RECORD" POSITION
NC NO CONNECTION
ALL MEASUREMENTS TAKEN IN "LISTEN" POSITION UNLESS OTHERWISE DESIGNATED.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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FIGURE 9. MODEL 250 SCHEMATIC WIRING DIAGRAM.

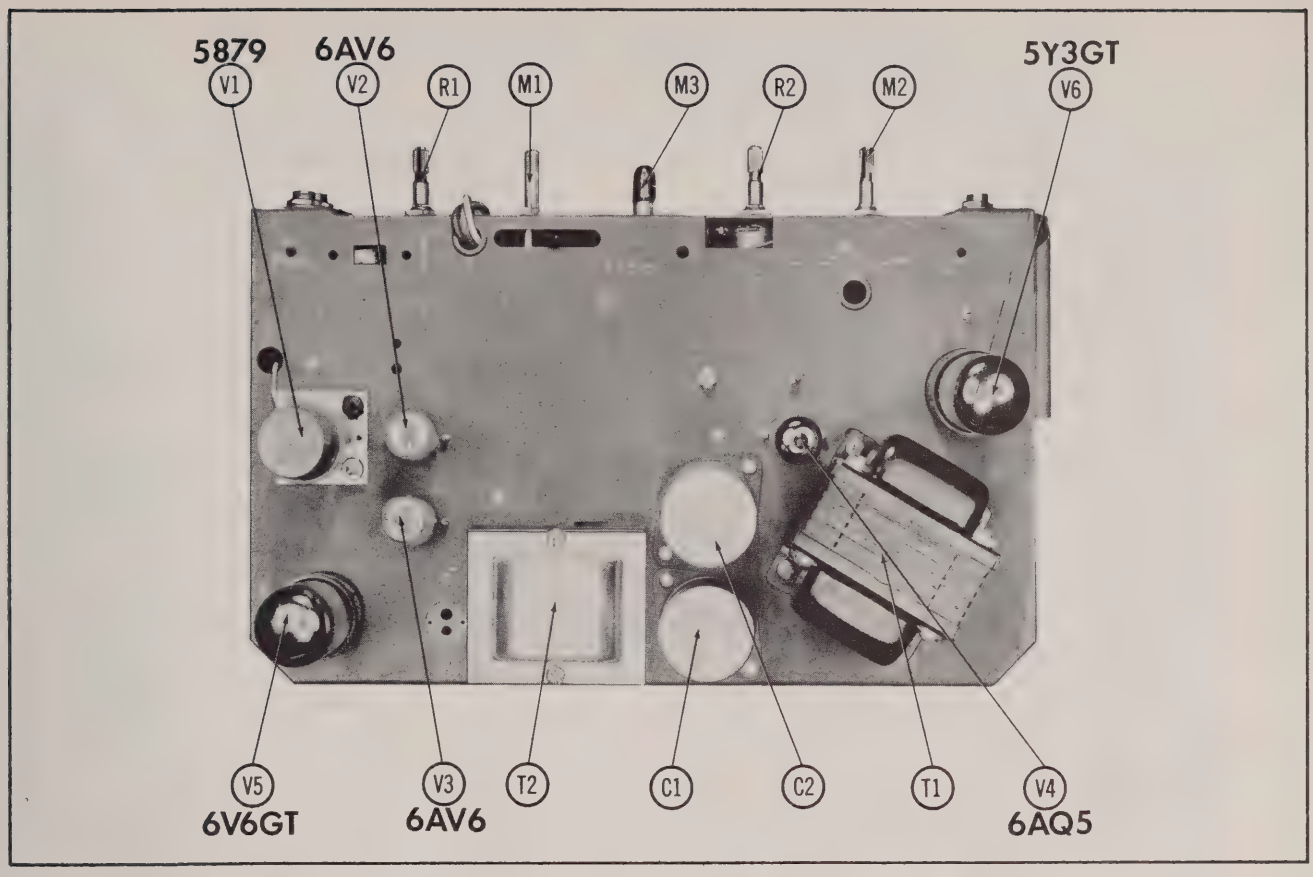


FIGURE 10. FRONT VIEW OF MODEL 260 AMPLIFIER ASSEMBLY.

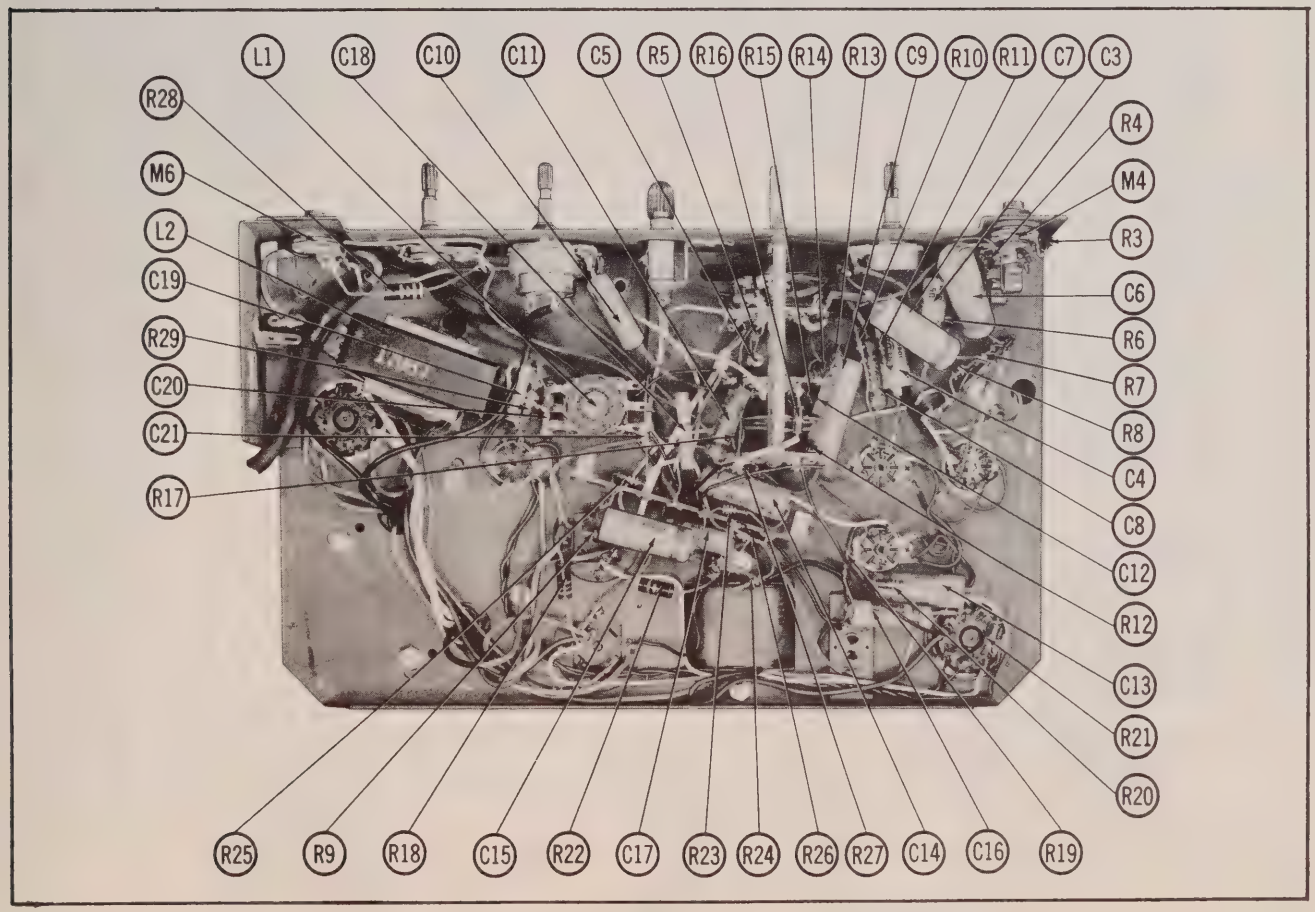
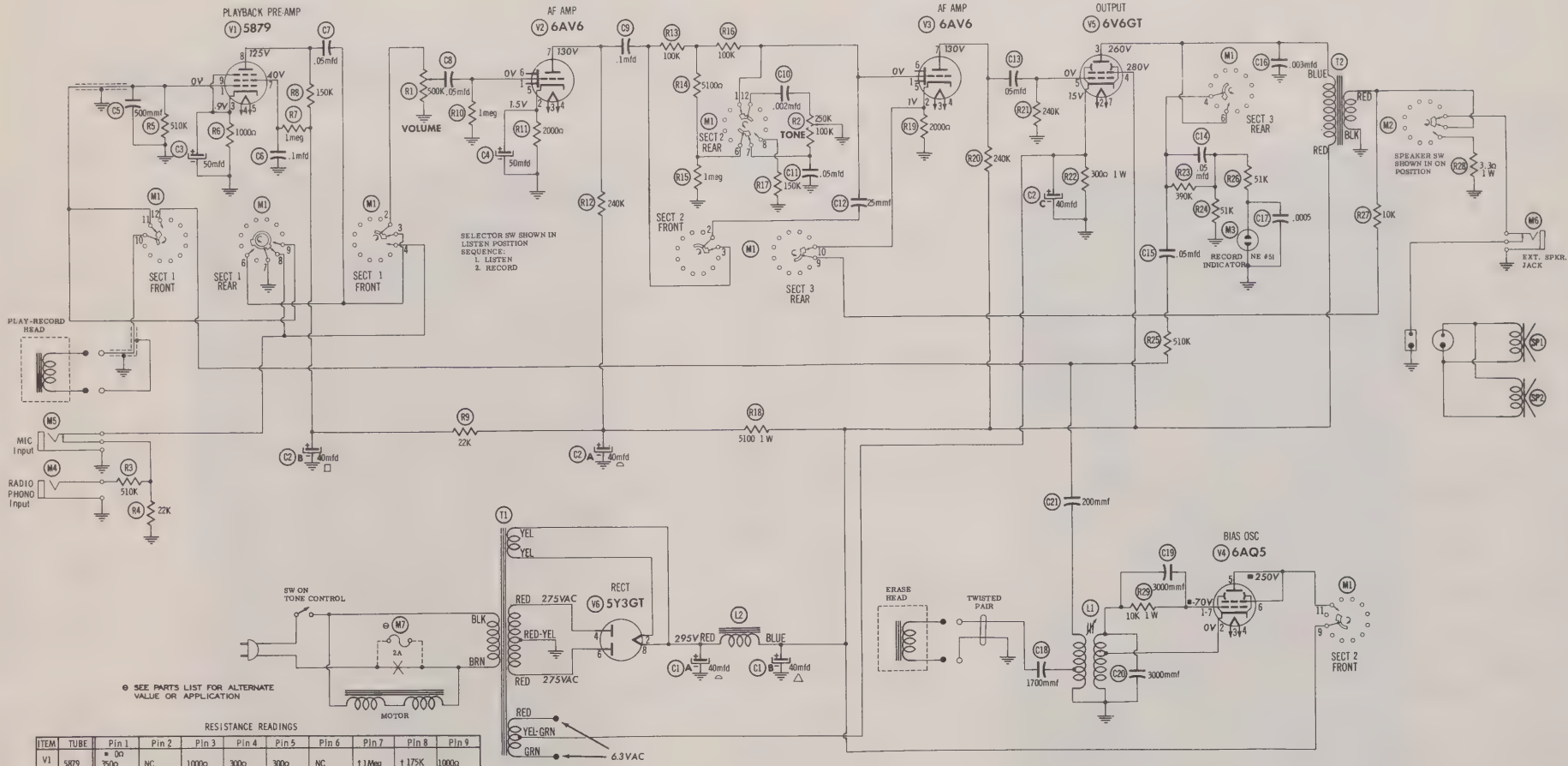


FIGURE 11. REAR VIEW OF MODEL 260 AMPLIFIER ASSEMBLY.


PLAYBACK PRE-AMP
V1 5879
AF AMP
V2 6AV6
AF AMP
V3 6AV6
OUTPUT
V5 6V6GT
PLAY-RECORD HEAD
MIC Input
RADIO PHONO Input
VOLUME
TONE
SECT 1 FRONT
SECT 1 REAR
SECT 2 FRONT
SECT 2 REAR
SECT 3 REAR
SELECTOR SW SHOWN IN LISTEN POSITION
SEQUENCE:
1. LISTEN
2. RECORD
RECORD INDICATOR NE #51
SPEAKER SW SHOWN IN ON POSITION
EXT. SPKR. JACK
SW ON TONE CONTROL
RECT
V6 5Y3GT
MOTOR
ERASE HEAD
TWISTED PAIR
BIAS OSC
V4 6AQ5
SECT 2 FRONT
RED 275VAC
RED-YEL
RED 275VAC
RED
YEL-GRN
GRN
6.3VAC
295V
BLK
BRN
YEL
YEL
RED
BLUE
BLK
RED
BLUE
RED
BLK
RED
BLUE
R1 500K
R2 250K
R3 510K
R4 22K
R5 510K
R6 1000Ω
R7 1meg
R8 150K
R9 22K
R10 1meg
R11 2000Ω
R12 240K
R13 100K
R14 5100Ω
R15 1meg
R16 100K
R17 150K
R18 5100 1W
R19 2000Ω
R20 240K
R21 240K
R22 300Ω 1W
R23 390K
R24 51K
R25 510K
R26 51K
R27 10K
R28 3.3Ω 1W
R29 10K 1W
C1 A 40mfd
C1 B 40mfd
C2 A 40mfd
C2 B 40mfd
C2 C 40mfd
C3 50mfd
C4 50mfd
C5 500mmf
C6 .1mfd
C7 .05mfd
C8 .05mfd
C9 .1mfd
C10 .002mfd
C11 .05mfd
C12 25mmf
C13 .05mfd
C14 .05 mfd
C15 .05mfd
C16 .003mfd
C17 .0005
C18 1700mmf
C19
C20 3000mmf
C21 200mmf
L1
L2
T1
T2
M1
M2
M3
M4
M5
M6
M7
SP1
SP2
2A
SECTOR SW
SECTOR SW
SECTOR SW

MODEL 250 SERIES — ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
V1		5879, Playback Pre-Amp.
V2		12AX7, AF Amplifier
V3		12AX7, AF Amplifier, Phase Inverter
V4		6AQ5, Audio Output
V5		6AQ5, Audio Output
V6		6AQ5, Bias Oscillator
V7		5Y3GT, Rectifier
C1A	241-14236	Elect. Cap., 40 Mfd. @ 450V.
C1B		Elect. Cap., 40 Mfd. @ 450V.
C2A	241-14238	Elect. Cap., 40 Mfd. @ 450V.
C2B		Elect. Cap., 40 Mfd. @ 450V.
C2C		Elect. Cap., 40 Mfd. @ 25V.
C3	S6063	Elect. Cap., 50 Mfd. @ 6V.
C4	S6065-3	Cap. Ceramic, 200 Mmf. @ 500V.
C5	S3595	Cap. Paper, .1 Mfd. @ 400V.
C6	211-15048	Cap. Paper, .047 Mfd. @ 400V.
C7	S4512	Cap. Paper, .005 Mfd. @ 600V.
C8	211-15048	Cap. Paper, .047 Mfd. @ 400V.
C9	S4510	Cap. Paper, .002 Mfd. @ 600V.
C10	211-14912	Cap. Paper, .05 Mfd. @ 200V.
C11	S6065-7	Cap. Mica, 15 Mmf. @ 500V.
C12	211-19827	Cap. Mica, 3000 Mmf. @ 500V.
C13	211-19833	Cap. Mica, 300 Mmf. @ 500V.
C14	S4282	Cap. Paper, .025 Mfd. @ 400V.
C15	S4282	Cap. Paper, .025 Mfd. @ 400V.
C16	S6065-2	Cap. Ceramic, 100 Mmf. @ 500V.
C17	211-15048	Cap. Paper, .047 Mfd. @ 500V.
C18	S6065-5	Cap. Ceramic, 1000 Mmf. @ 500V.
C19	S6065-11	Cap. Ceramic, 50 Mmf. @ 500V.
C20	S6065-11	Cap. Ceramic, 50 Mmf. @ 500V.
C21	S6065-2	Cap. Ceramic, 100 Mmf. @ 500V.
C22	241-14260-1	Cap. Ceramic, 3000 Mmf. @ 500V.
C23	241-14260-2	Cap. Ceramic, 1700 Mmf. @ 500V.
C24	241-14260-1	Cap. Ceramic, 3000 Mmf. @ 500V.
C25	241-20699	Cap., Paper, 2 Mfd. @ 50V. (Used only on Models 252, 253, 254, and 255)

Ref. No.	Part No.	Description
R1	241-17940-1	Volume Control, 500K
R2	241-17941-1	Tone Control 250K, 100K
R3	29501-53	Resistor, 510K, 1/2 W.
R4	29501-11	Resistor, 1000Ω, 1/2 W.
R5	29501-57	Resistor, 1 Meg, 1/2 W.
R6	29501-44	Resistor, 150K, 1/2 W.
R7	29501-53	Resistor, 510K, 1/2 W.
R8	29501-24	Resistor, 10K, 1/2 W.
R9	29501-29	Resistor, 22K, 1/2 W.
R10	29501-14	Resistor, 2000Ω, 1/2 W.
R11	29501-41	Resistor, 100K, 1/2 W.
R12	29501-106	Resistor, 270K, 1/2 W.
R13	29501-48	Resistor, 240K, 1/2 W.
R14	29501-14	Resistor, 2000Ω, 1/2 W.
R15	29501-41	Resistor, 100K, 1/2 W.
R16	29501-41	Resistor, 100K, 1/2 W.
R17	29501-41	Resistor, 100K, 1/2 W.
R18	29501-21	Resistor, 5100Ω, 1/2 W.
R19	29501-57	Resistor, 1 Meg, 1/2 W.
R20	29501-44	Resistor, 150K, 1/2 W.
R21	29501-113	Resistor, 390K, 1/2 W.
R22	29501-47	Resistor, 200K, 1/2 W.
R23	29501-75	Resistor, 5100Ω, 1 W.
R24	29501-15	Resistor, 2400Ω, 1/2 W.
R25	29501-14	Resistor, 2000Ω, 1/2 W.
R26	29501-48	Resistor, 240K, 1/2 W.
R27	29501-48	Resistor, 240K, 1/2 W.
R28	29501-50	Resistor, 360K, 1/2 W.
R29	29501-12	Resistor, 12K, 1/2 W.
R30	29501-50	Resistor, 360K, 1/2 W.
R31	29501-90	Resistor, 240Ω, 2 W.
R32	29501-32	Resistor, 30K, 1/2 W.
R33	29501-52	Resistor, 470K, 1/2 W.
R34	29501-137	Resistor, 430Ω, 1/2 W.
R35	241-21803	Resistor, 8Ω, 4 W.
R36	29501-76	Resistor, 10K, 1 W.
T1	242-21908	Power Transformer (Used on Models 250, 252, and 254)
	242-22170	Power Transformer (Used on Models 251, 253, and 255)
T2	242-21783	Output Transformer
L1	241-14246-1	Bias Oscillator
L2	242-21787	Choke
SP1	241-21849	Speaker, 5" Round (Used on Models 250 and 251)
SP2	241-21849	Speaker, 5" Round (Used on Models 250 and 251)
SP3	241-22482	Speaker, 6 X 9" Oval (Used on Models 252, 253, 254 and 255)
SP4	241-22483	Speaker, 3" Round (Used on Models 252, 253, 254 and 255)
M1	241-17445-7	Selector Switch
M2	241-21802-1	Equalizing Switch
M3	241-21802-1	Equalizing Switch
M4	241-17942-2	Speaker On-Off Switch
M5	241-21804	Muting Switch
M6	241-21788	External Speaker Jack
M7	S4323	Radio-Phono Jack
M8	S4324	Mike Jack
M9	241-21798	Record Level Meter
M10	211-19988	Rectifier (1N65)
M11	P11139-1	Lamp #51

MODEL 260 SERIES — ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
V1		5879, Playback Pre-Amp.	C20	241-14260-1	Cap. Ceramic, 3000 Mmf. @ 500V.
V2		6AV6, AF-Amplifier			
V3		6AV6, AF-Amplifier	C21	S6065-3	Cap. Ceramic, 200 Mmf.
V4		6AQ5, Bias Oscillator	R1	241-17940-2	Volume Control 500K
V5		6V6GT, Power Output	R2	241-17941-2	Tone Control 100K, 250K
V6		5Y3GT, Rectifier	R3	29501-53	Resistor, 510K, 1/2 W.
C1A	241-14236	Elect. Cap., 40 Mfd. @ 450V.	R4	29501-29	Resistor, 22K, 1/2 W.
			R5	29501-53	Resistor, 510K, 1/2 W.
C1B		Elect. Cap., 40 Mfd. @ 450V.	R6	29501-11	Resistor, 1000Ω, 1/2 W.
			R7	29501-57	Resistor, 1 Meg, 1/2 W.
C2A	241-14238	Elect. Cap., 40 Mfd. @ 450V.	R8	29501-44	Resistor, 150K, 1/2 W.
			R9	29501-29	Resistor, 22K, 1/2 W.
C2B		Elect. Cap., 40 Mfd. @ 450V.	R10	29501-57	Resistor, 1 Meg, 1/2 W.
			R11	29501-14	Resistor, 2000Ω, 1/2 W.
C2C		Elect. Cap., 40 Mfd. @ 25V.	R12	29501-48	Resistor, 240K, 1/2 W.
			R13	29501-41	Resistor, 100K, 1/2 W.
C3	S6063	Elect. Cap., 50 Mfd. @ 6V.	R14	29501-21	Resistor, 5100Ω, 1/2 W.
			R15	29501-57	Resistor, 1 Meg, 1/2 W.
C4	S6063	Elect. Cap., 50 Mfd. @ 6V.	R16	29501-41	Resistor, 100K, 1/2 W.
			R17	29501-44	Resistor, 150K, 1/2 W.
C5	S3750	Cap. Ceramic, 500 Mmf. @ 500V.	R18	29501-75	Resistor, 5100, 1 W.
			R19	29501-14	Resistor, 2000Ω, 1/2 W.
C6	S3595	Cap. Paper, .1 Mfd. @ 400V.	R20	29501-48	Resistor, 240K, 1/2 W.
			R21	29501-48	Resistor, 240K, 1/2 W.
C7	S4261	Cap. Paper, .05 Mfd. @ 400V.	R22	29501-98	Resistor, 300Ω, 1 W.
			R23	29501-51	Resistor, 390K, 1/2 W.
C8	211-14912	Cap. Paper, .05 Mfd. @ 200V.	R24	29501-35	Resistor, 51K, 1/2 W.
			R25	29501-53	Resistor, 510K, 1/2 W.
C9	S3595	Cap. Paper, .1 Mfd. @ 400V.	R26	29501-35	Resistor 51K, 1/2 W.
			R27	29501-24	Resistor 10K, 1/2 W.
C10	S4510	Cap. Paper, .002 Mfd. @ 600V.	R28	29502-21	Resistor 3.3Ω, 1 W.
			R29	29501-76	Resistor 10K, 1 W.
C11	211-14912	Cap. Paper, .05 Mfd. @ 200V.	T1	242-17934	Power Transformer (Used on Model 260)
C12	29670-6	Cap. Mica, 25 Mmf. @ 500V.		242-18104	Power Transformer (Used on Model 261)
C13	S4261	Cap. Paper, .05 Mfd. @ 400V.	T2	242-17936	Output Transformer
			L1	241-14246-1	Osc. Coil
C14	S4261	Cap. Paper, .05 Mfd. @ 400V.	L2	242-17937	Choke
			SP1	241-21830	PM Speaker
C15	S4261	Cap. Paper, .05 Mfd. @ 400V.	SP2	241-21830	PM Speaker
			M1	241-17945-5	Selector Switch
C16	241-16370	Cap. Paper, .003 Mfd. @ 1000V.	M2	241-17942-2	Speaker Switch On-Off
			M3	241-14225	Neon Lamp
C17	S4556	Cap. Paper, .0005 Mfd. @ 500V.	M4	S4323	Radio-Phono Input Jack
			M5	S4324	Mic Input Jack
C18	241-14260-2	Cap. Ceramic, 1700 Mmf. @ 500V.	M6	S4324	External Speaker Jack
			M7		Fuse, 2 Amp. (Used in Canadian Models only)
C19	241-14260-1	Cap. Ceramic, 3000 Mmf. @ 500V.			

PARTS LIST
USE ONLY CERTIFIED WEBSTER ELECTRIC PARTS

Many of the parts of the recorder are indicated on the illustrations with the reference numbers in the parts list. It is preferable to replace complete sub-assemblies from the standpoint of saving time on repairs and for better performance after repair. When ordering parts always refer to the model and serial number of the unit for which parts are required.

a. The list is separated into four columns: Ref. No., two Part No. columns for the two different model series, and the Description column. The Ref. No. column has a number which is assigned in numerical order of appearance of the part. The Description column gives the part name.

b. Some items will have no part numbers listed for one of the models which simply means that the part is not used on those models, and it is therefore peculiar to that particular model in which column the number appears.

c. When ordering a part, include the Ref. No. from the first column, the Part No. from the APPLICABLE column, and the Description. To avoid unnecessary delay and expense in procuring parts, be sure to select the number only from the column for the model under repair.

d. The following code is used in the parts list to indicate various differences of equipment within one particular series of the recorders. An uncoded part number immediately above a coded part number applies to all other models in the series.

- ▲ Model 250
- ■ Model 251
- ♦ Models 252, 254
- * Models 253, 255
- ● Model 260
- † Model 261

Ref. No.	Model 250 Series Part No.	Model 260 Series Part No.	Description
1	241-20436-2	241-20436-2	Control Knobs, Amplifier
	241-20436 ♦*		
2	242-20443-1	242-20443-1	Knob Assembly
	242-20433 ♦*		
3	241-15116	241-15116	Set Screw
4	242-20437-1	242-20437-1	Knob Assembly
	242-20437 ♦*		
5	241-20433-1	241-17816-8	Cover
	241-20433-2 ♦		
6	29529-47	29529-14	Screw
7		242-21842	Knob Ass'y., Counter
8	29529-45	29529-45	Rec. Pan Hd. Mach. Screw
9	241-20434-2	241-20434-2	Cover
	241-20434 ♦		
10	242-17761-2	242-17761-2	Reel Shaft Assembly
11	242-17771-3	242-17771-3	Reel Shaft Assembly
12	241-17770	241-17770	Washer
13	241-17814-4	241-17814-3	Top Panel
	242-17814-6 ♦*		
14	29529-59	29529-58	Top Panel Mtg. Screws
15	29527-4	29527-4	Screw
16	29602-103	29602-103	Washer, Steel
17	241-17747	241-17747	Washer, Fibre
18	242-17744	242-17744	Pinch Roller Assembly
19	241-17722	242-17722	Washer
20	241-12138	241-12138	Spring
21	29650-1	29650-1	Retaining Ring
22	242-17741	242-17741	Pinch Roller Lever Ass'y.
23	242-17739	242-17739	Follower Lever Assembly
24	241-14252	241-14252	Spring
25	29527-14	29527-14	Screw
26	29602-114	29602-114	Washer
27	29650-1	29650-1	Retaining Ring
28	242-17748-4	242-17748	Pressure Pad Assembly
29	241-17801	241-17801	Spring
30	242-14159	242-14159	Head & Can Assembly
31	29527-13	29527-13	Screw
32	241-17754	241-17754	Top, Tape Guide
33	241-17753	241-17753	Spacer, Tape Guide
34	241-17752	241-17752	Shelf, Tape Guide
35	242-17710	242-17710	Pinch Roller Cam Ass'y.
35A	242-17707-2	242-17707-3	Cam & Shaft Assembly
36	242-17713-4	242-17713	Index & Interlock Lever Ass'y.
37	241-17802	241-17802	Spring
38	29651-1	29651-1	Retaining Ring
39	241-12059	241-12059	Spring Tension Washer
40	29602-124	29602-124	Washer
41			Remote Lever Arm (part of item 51)
42	241-17734	241-17734	Spring
43	242-17683-4	242-17683-7	Mechanism Plate Ass'y.
44	29651-4	29651-4	Retaining Ring
45	241-17758-3	241-17758-3	Brake Lever Assembly
46	241-17734	241-17734	Spring
47	241-12059	241-12059	Spring Tension Washer
48	29602-122	29602-122	Washer
49	29651-1	29651-1	Retaining Ring
50	241-17734	241-17734	Spring
51	242-17755	242-17755	Remote Lever Assembly
52	242-17728		Switch Cam Assembly
52A		242-23110	Collar & Screw Assembly
53	29540-9	29540-9	Set Screw, Cup Pt.
53A	29542-5	29542-5	Set Screw, Cone Pt.
54	241-17758-3	241-17758-3	Brake Lever Assembly
55	242-17695-3	242-17695-3	Reel Shaft Support Ass'y. (left)
56	29602-124	29602-124	Washer
57	241-12059	241-12059	Spring Tension Washer
58	29651-1	29651-1	Retaining Ring
59	241-17770	241-17770	Washer
60	241-17801	241-17801	Spring
61	241-17801	241-17801	Spring
62	242-17703-4	242-17703-4	Reel Shaft Support Ass'y. (right)
63	241-17770	241-17770	Washer
64	29650-2	29650-2	Retaining Ring
65	241-20551	241-20551	Washer, Fibre
66	241-20481	241-20481	Belt
67	241-20479	241-21846	Pulley
68	241-17775	241-17775	Washer
69	241-17086-4	241-17086-4	Pin
69A	241-17777	241-17777	Clutch Disc.
69B	29650-2	29650-2	Retaining Ring
70	242-17773	242-17773	Reel Pulley Assembly
71	29602-102	29602-102	Washer
72	241-17644	241-17644	Spring
73	241-17799-1	241-17799-1	Self Locking Wing Nut
74	241-17802	241-17802	Spring
75	241-17802	241-17802	Spring
76	242-17719-3	242-17719-3	Idler Assembly
77	29650-1	29650-1	Retaining Ring
78	241-17723	241-17723	Spring Tension Washer
79	242-17724-2	242-17724-3	Cam Shaft Assembly
80	241-17733	241-17733	Follower Lever
81	241-17735	241-17735	Idler Link
82	241-17735	241-17735	Idler Link
83	241-17733	241-17733	Follower Lever
84	242-17766	242-17766	Reel Pulley Assembly
85	29540-9	29540-9	Set Screw, Cup Point

Ref. No.	Model 250 Series Part No.	Model 260 Series Part No.	Description
86	242-17719-3	242-17719-3	Idler Assembly
	242-17719-4 ■ *	242-17719-4†	
87	241-17723	241-17723	Spring Tension Washer
88	29650-1	29650-1	Retaining Ring
89	242-17778-1	242-17778-1	Flywheel & Shaft Assembly
90	241-13609	241-13609	Ball
91	29650-6	29650-6	Retaining Ring
92	241-17795	241-17795	Spring Tension Washer
93	241-17794	241-17794	Washer
94	242-17791	242-17791	Clutch Disc Assembly
95	241-17790-1	241-17790-1	Motor Pulley Clutch Washer
96	241-17789-2	241-17789-2	Motor Pulley
	241-17789-3 ■ *	241-17789-3†	
97	29540-9	29540-9	Set Screw
98	241-16306	241-16306	Sems Fastener
99	241-20480	241-21904	Pulley
99A	29540-1	29540-11	Set Screw

Ref. No.	Model 250 Series Part No.	Model 260 Series Part No.	Description
100	242-17765-3	242-17765-3	Support Plate Assembly
101	241-17763	241-17763	Washer
102	241-17827	241-17827	Sems Fastener
103	241-17786-3	241-17786-3	Motor Mtg. Plate
104	241-20800	241-20800	Motor
	241-17887 ■ *	241-17887†	
105	241-14134	241-14134	Fan
106			Set Screw
107	241-17717	241-17717	Idler Link
108	241-17723	241-17723	Spring Tension Washer
109	29650-1	29650-1	Retaining Ring
110	242-17719-3	242-17719-3	Idler Assembly
111	242-17722-1	242-17722-1	Washer
112	29650-1	29650-1	Retaining Ring
113	241-20477	242-21809	Counter
114	241-17886	241-17886	Sems Fastener
115	241-20478		Bracket

HOTPOINT MODELS 17S301, 17S302 ("MM" Line)

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HOTPOINT, MODEL 17S302 ("MM" LINE)

TRADE NAME	Hotpoint, Models 17S301, 17S302 ("MM" Line)
MANUFACTURER	Hotpoint Co., 5600 W. Taylor St., Chicago 44, Ill.
TYPE SET	Television Receiver
TUBES	Fifteen
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING 1. 22 Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13VHF, 14 thru 83UHF, Video IF 45. 75MC, Sound IF 41. 25MC (Intercarrier)

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HOTPOINT MODELS 17S301, 17S302 ("MM" Line)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push-on type control knobs from side panel of cabinet.

2. Remove 2 metal screws. Remove rear cover.

3. Remove 2 metal screws holding chassis to cabinet bottom and 1 metal screw from top center of cabinet. (Just above yoke).

4. Disconnect speaker leads. Remove 2 speaker nuts. Remove speaker.

5. Remove picture tube socket, ion trap, centering magnet and yoke clamp.

6. Remove or lower adjustable foot at the bottom rear of cabinet.

7. Remove chassis by grasping the tuner and HV cage and tilt the top forward, at the same time pull the HV cage to the rear.

8. Slip the chassis past the yoke keeping tuner shaft in cabinet hole. The right side of chassis should clear cabinet rear so HV lead can be removed.

9. Chassis may now slid from cabinet right side first.

MODEL

17S302

HOTPOINT MODELS
17S301, 17S302 ("MM" Line)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 2 metal screws from bottom front of cabinet (holding bezel to cabinet). Remove bezel and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 4.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Set horizontal hold to center of rotation. Adjust horizontal stabilizer coil (L28) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust the ratio detector secondary (A10) located on top of chassis.

FUSES

One fuse is used for L. V. power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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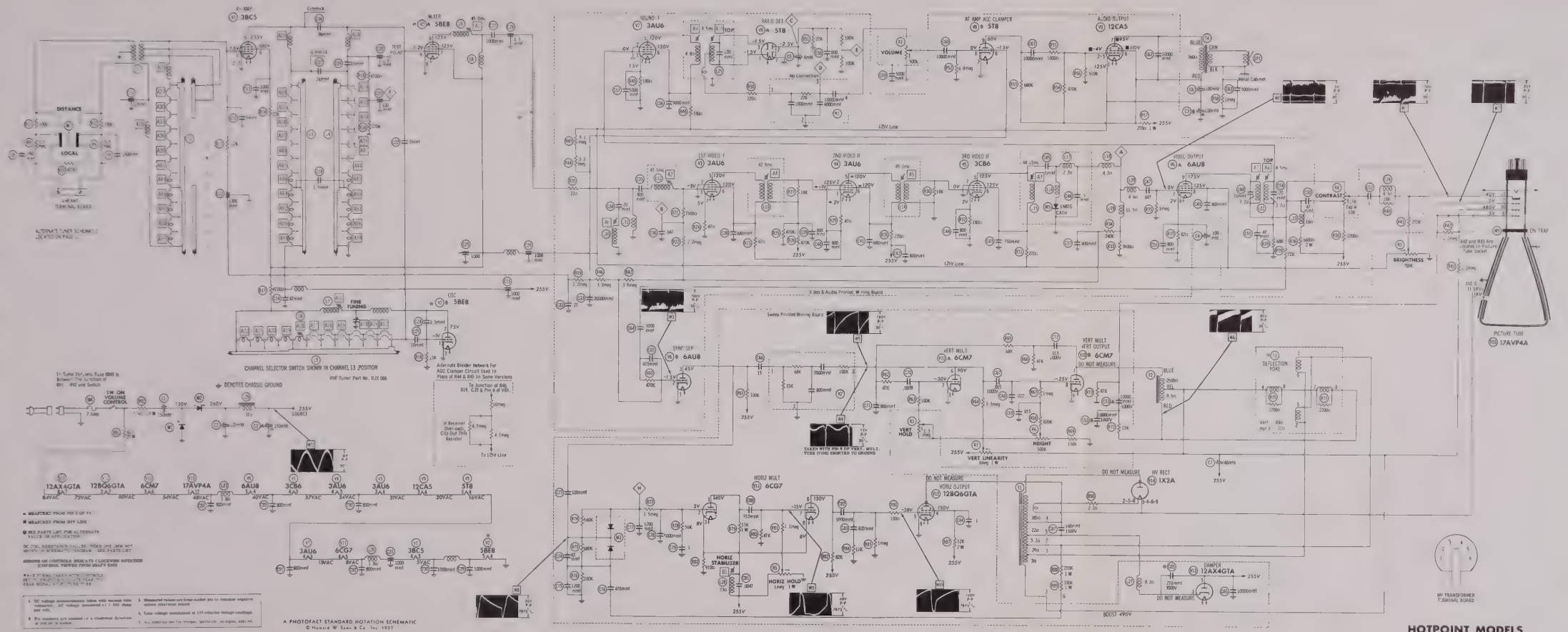
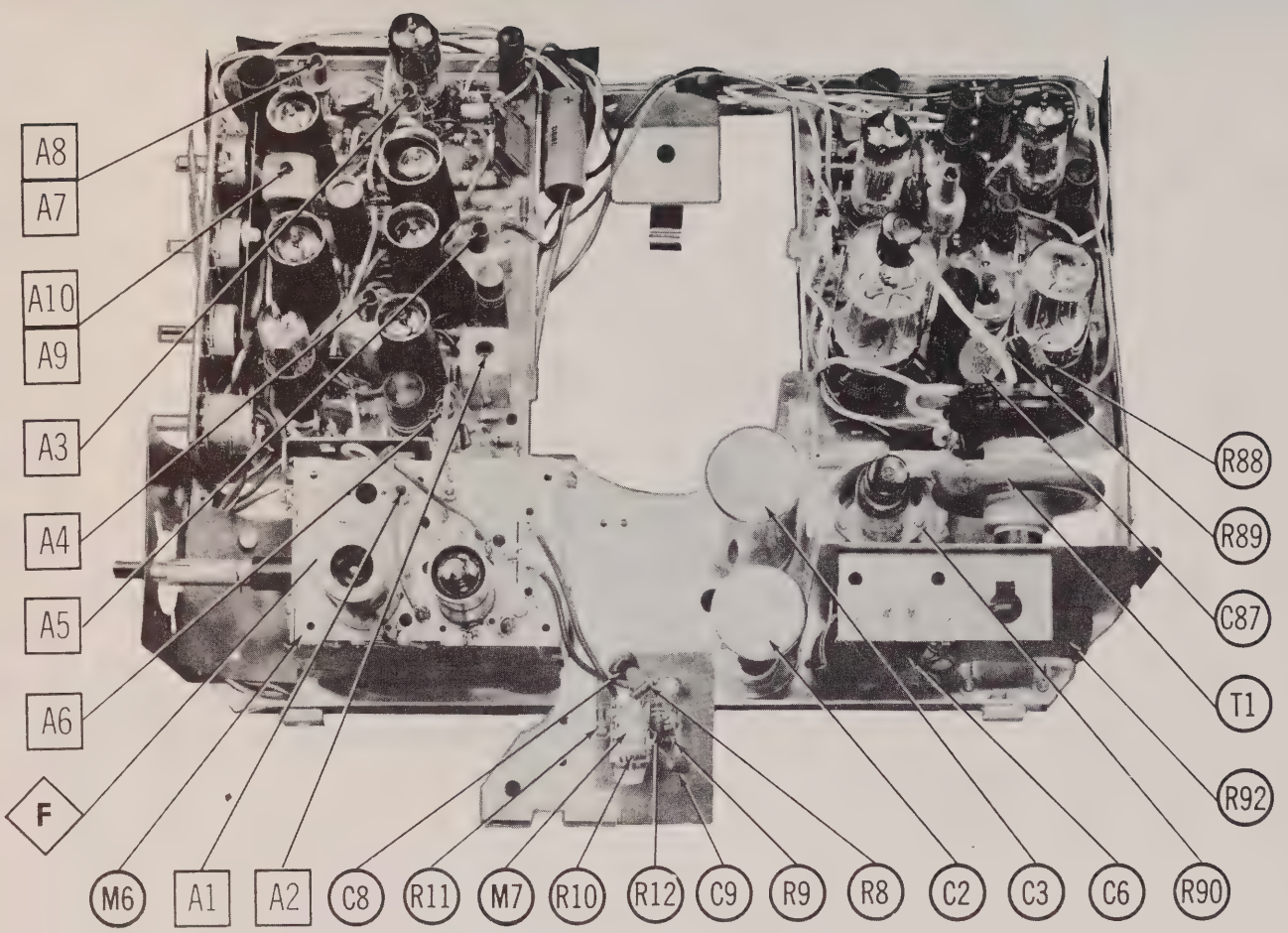


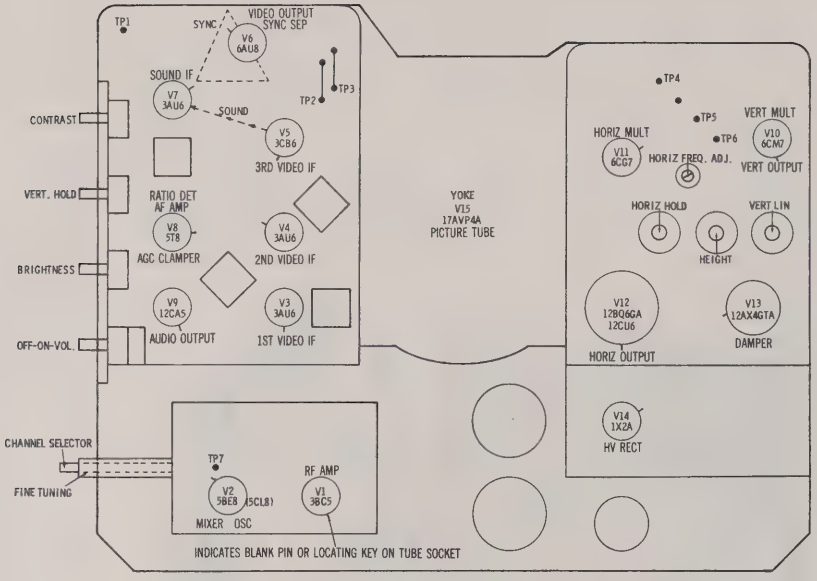
HOTPOINT MODELS
175301, 175302 ("MM" Line)



CHASSIS TOP VIEW

HOTPOINT MODELS
175301, 175302 ("MM" Line)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

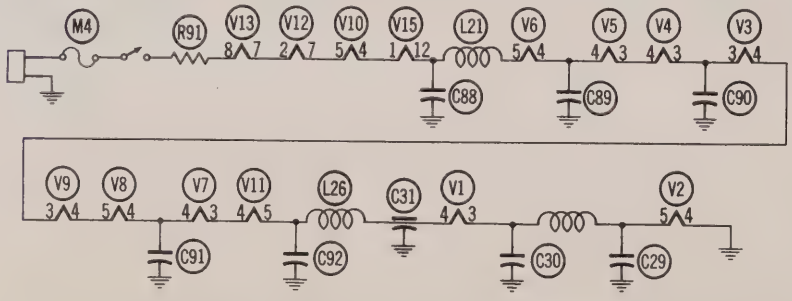
POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifiers (M1 & M2), Fuse (M4)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6, V9**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V15**
Has pic, no sound - **V7, V8, V9**
Overloaded picture - **V8**

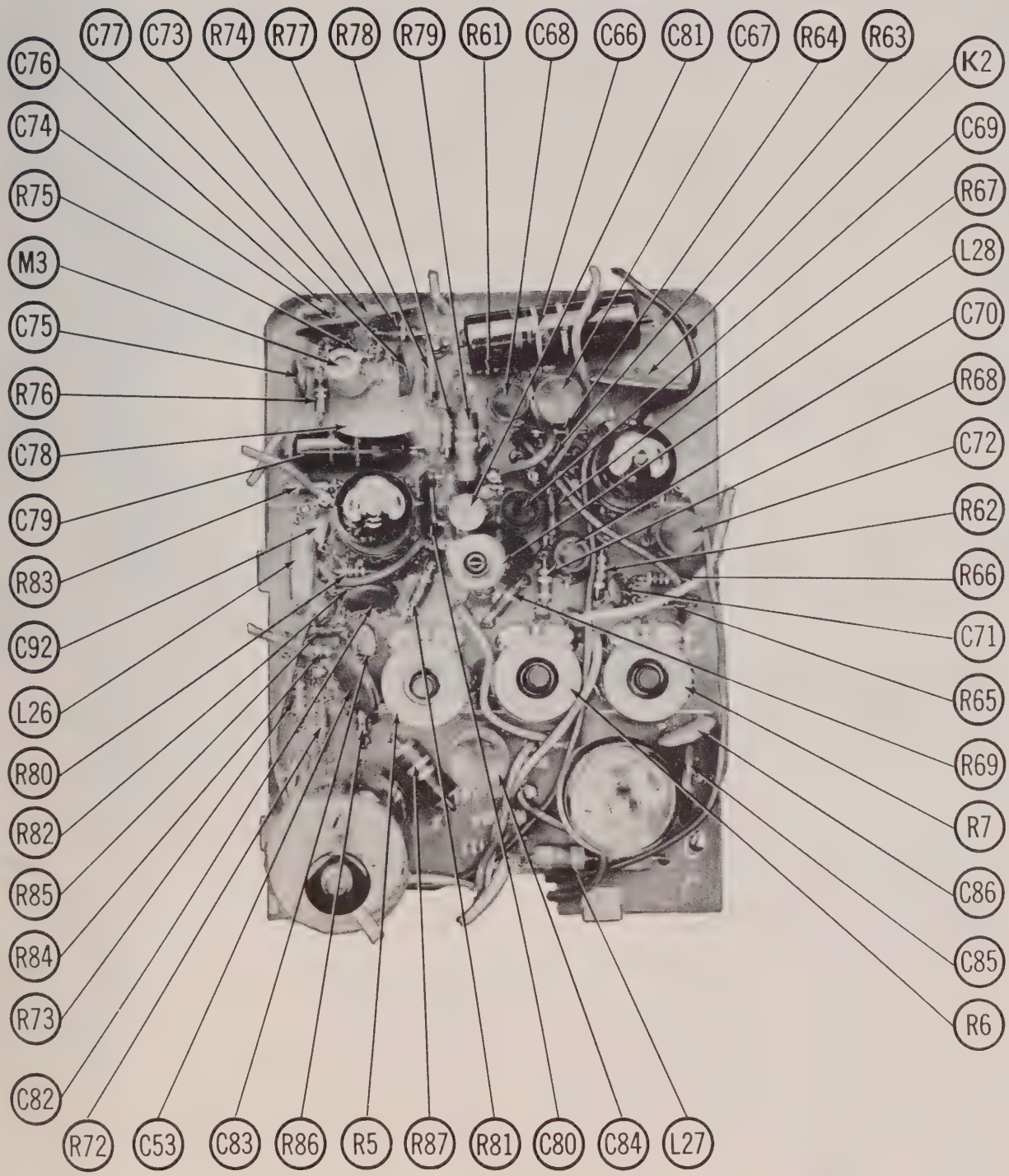
SYNC FAILURE
No vert. sync - **V6, V10**
No horiz. sync - **V6, V11**
No vert. or horiz. sync - **V11**

SWEEP FAILURE
No raster, has sound - **V11, V12, V13, V14, V15**
No vertical deflection - **V10**
Poor vert. linearity or foldover - **V10**
Poor horiz. linearity or foldover - **V11, V12, V13**
Narrow picture - **V11, V12, V13, V14, M1, M2**
Vert. off freq. - **V6, V10**
Horiz. off freq. - **V6, V11**

NOTE: Since this receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative (See circuit below).



DENVER, COLORADO



HORIZONTAL & VERTICAL SWEEP PRINTED CIRCUIT

SET 347 FOLDER 6

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
The high voltage shock hazard may be eliminated by connecting the negative lead of 48 volt battery to pin 5 of 1B3GGTA (V13). Positive side to chassis.
Allow a 30 minute warm-up period for receiver and test equipment.

VIDEO IF ALIGNMENT

Turn the volume control fully counter-clockwise. Turn the contrast control fully clockwise. Connect the negative lead of a 3 volt battery to point B. Connect the positive lead to chassis.
Calibrate the sweep so that 3 mate peak to peak produced two inch vertical deflection.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
NOTE: It is not necessary to perform steps 1 thru 4 unless adjustments A1 thru A5 are far from their proper frequencies. For proper overall desired response, step 5 is necessary.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1	Direct	High side to pin 9 on ungrounded tube shield floating over converter tube (V2). Low side to chassis. Use very short shielded leads.	Not Used	45.9MC (unmod)	Any non-interfering channel.	Use VTVM. DC probe thru 10K to point (A). Common to chassis.	A1	Use only enough generator output for usable indication on VTVM. Adjust for maximum deflection.
2.	"	"	"	42.5MC	"	"	A2	"
3.	"	"	"	44.15MC	"	"	A3	"
4.	"	"	"	42.9MC	"	"	A4	"
5.	"	"	"	45.1MC	"	"	A5	"
6.	"	44MC (100KC Swp)	4. 75MC 42.5MC 45.9MC 45.75MC	"	"	Vert. amp. thru 10K to point (A). Low side to chassis	A1, A2, A3, A4, A5, A6	Adjust A1 thru A6 for response similar to Fig. 1. Adjust A4 to place 42.5MC marker on low frequency side. Adjust A5 to place 45.75MC marker on high frequency side. Adjust A2, A3 and A4 to shape peak region of curve. The 41.25MC sound marker should not be above 9% on response curve. Adjust A6 to place 47.25MC marker in trap notch.

4.5MC TRAP ALIGNMENT

Set contrast control to maximum.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	300MFD	High side to point (A). Low side to chassis.	Not Used	4.5MC (400% AM)	Any	Vert. amp. thru detector probe to pin 11 (cathode) of picture tube. Low side to chassis.	A7	Adjust for MINIMUM indication on scope.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (C) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	Direct	High side to point (A). Low side to chassis.	4.5MC (unmod)	Any non-interfering channel.	DC probe to point (D). Common to chassis.	A8, A9	Adjust for maximum deflection on VTVM.
9.	"	"	"	"	DC probe to point (C). Common to point (D).	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 4500KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any non-interfering channel.	Vert. amp. to point (C). Low side to chassis.	A8, A9	Disconnect stabilizing capacitor (C8). Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
9.	"	"	"	"	"	Vert. amp. to point (D). Low side to chassis.	A10	Reconnect C8. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A9 for maximum amplitude and symmetry of crossover lines.

SOUND IF ALIGNMENT USING TV SIGNAL AND VTVM

Follow steps 8 and 9 using station audio instead of 4.5MC signal generator frequency. Connect VTVM in the same procedure.

FIG. 7

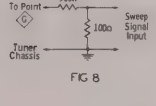


FIG 8

FIG 9

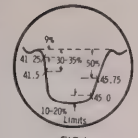
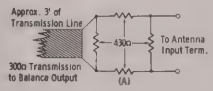
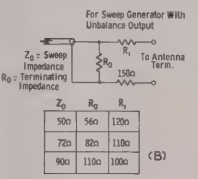


FIG 1

FIG. 2

FIG. 3





Z_0	R_0	R_1
50Ω	56Ω	120Ω
72Ω	82Ω	110Ω
90Ω	110Ω	100Ω

(B)

FIG 4

FIG 5

FIG. 6

VHF OSCILLATOR ALIGNMENT FOR VHF TUNER RJX-088

Connect bias as under "Video IF Alignment".
Remove the 300Ω transmission line from the input VHF antenna matching transformer (L1). Set the fine tuning knob 2/3 turn from maximum counter clockwise position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Fig. 4	Thru dummy antenna (Fig. 4) across primary of antenna matching transformer (L1).	213MC (90-15MC Swp)	211. 25MC	13	Vert. amp. thru 10K to point (A). Low side to chassis.	A11	Adjust so that video marker falls at 45% on response curve as in Fig. 5.
11.	"	"	207MC (90-15MC Swp)	205. 25MC	12	"	A12	"
12.	"	"	201MC (90-15MC Swp)	199. 25MC	11	"	A13	"
13.	"	"	195MC (90-15MC Swp)	193. 25MC	10	"	A14	"
14.	"	"	189MC (90-15MC Swp)	187. 25MC	9	"	A15	"
15.	"	"	183MC (90-15MC Swp)	181. 25MC	8	"	A16	"
16.	"	"	177MC (90-15MC Swp)	175. 25MC	7	"	A17	"
17.	"	"	85MC (90-15MC Swp)	83. 25MC	6	"	A18	"
18.	"	"	79MC (90-15MC Swp)	77. 25MC	5	"	A19	"
19.	"	"	69MC (90-15MC Swp)	67. 25MC	4	"	A20	"
20.	"	"	63MC (90-15MC Swp)	61. 25MC	3	"	A21	"
21.	"	"	57MC (90-15MC Swp)	55. 25MC	2	"	A22	"

VHF RF AND MIXER ALIGNMENT FOR VHF TUNER RJX-088

Connect bias as under "Video IF Alignment".
When checking response, tuner shield cover should be in place.
Remove the 300Ω transmission line from the input VHF antenna matching transformer (L1).
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
22.	Fig. 4	Thru dummy antenna (Fig. 4) across primary of antenna matching transformer (L1).	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 10K to point (A). Low side to chassis.	A23, A24, A25, A26	Adjust A23 and A23 for maximum amplitude and symmetry with markers placed as in Fig. 6. Adjust A25 and A26 for maximum gain. A23 affects the sound side of curve. A24 affects the video side.
23.	"	"	207MC (10MC Swp)	205. 25MC 209. 75MC	12	"	A27, A28, A29	Adjust for curve similar to Fig. 6. Adjusted in numerical order, the bandwidth is first affected, then the sound side of curve and then the video side.
24.	"	"	201MC (10MC Swp)	199. 25MC 203. 75MC	11	"	A30, A31, A32	"
25.	"	"	195MC (10MC Swp)	193. 25MC 197. 75MC	10	"	A33, A34, A35	"
26.	"	"	189MC (10MC Swp)	187. 25MC 191. 75MC	9	"	A36, A37, A38	"
27.	"	"	183MC (10MC Swp)	181. 25MC 185. 75MC	8	"	A39, A40, A41	"
28.	"	"	177MC (10MC Swp)	175. 25MC 179. 75MC	7	"	A42, A43, A44	"
29.	"	"	85MC (10MC Swp)	83. 25MC 87. 75MC	6	"	A45, A46, A47	Adjust for curve similar to Fig. 7. Adjusted in numerical order, the bandwidth is first affected, then the sound side of curve and then the video side.
30.	"	"	79MC (10MC Swp)	77. 25MC 81. 75MC	5	"	A48, A49, A50	"
31.	"	"	69MC (10MC Swp)	67. 25MC 71. 75MC	4	"	A51, A52, A53	"
32.	"	"	63MC (10MC Swp)	61. 25MC 65. 75MC	3	"	A54, A55, A56	"
33.	"	"	57MC (10MC Swp)	55. 25MC 59. 75MC	2	"	A57, A58, A59	"

PROPERTY OF

HOTPOINT MODELS
175301, 175302 ("MM" Line)

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT FOR VHF TUNER RJX-087

Connect bias as under "Video IF Alignment".
Remove the 300Ω transmission line from the input VHF antenna matching transformer (L1). Set the fine tuning knob 2/3 turn from maximum counter clockwise position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
34.	Fig. 4	Thru dummy antenna (Fig. 4) across primary of antenna transformer.	213MC (10MC Swp)	211.25MC	13	Vert. amp. thru 10K to point (A). Low side to chassis.	A60	Adjust for curve similar to Fig. 5 with marker at 45% on curve.
35.	"	"	201MC (10MC Swp)	199.25MC	11	"	A61	"
36.	"	"	183MC (10MC Swp)	181.25MC	8	"	A62	"
37.	"	"	85MC (10MC Swp)	83.25MC	6	"	A63	"
38.	"	"	79MC (10MC Swp)	77.25MC	5	"	A64	Adjust for curve similar to Fig. 5 with marker at 45% on curve. Adjust by expanding or compressing coil turns.
39.	"	"	69MC (10MC Swp)	67.25MC	4	"	A65	Adjust for curve similar to Fig. 5 with marker at 45% on curve.
40.	"	"	63MC (10MC Swp)	61.25MC	3	"	A66	Adjust for curve similar to Fig. 5 with marker at 45% on curve. Adjust by expanding or compressing coil turns.
41.	"	"	57MC (10MC Swp)	55.25MC	2	"	A67	Adjust for curve similar to Fig. 5 with marker at 45% on curve.

VHF RF AND MIXER ALIGNMENT FOR VHF TUNER RJX-087

Connect bias as under "Video IF Alignment".
When checking response tuner shield cover should be in place.
Remove the 300Ω transmission line from the input VHF antenna matching transformer (L1).
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
42.	Fig. 4	Thru dummy antenna (Fig. 4) across primary of antenna matching transformer.	213MC (10-15MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru 10K to point (F). Low side to chassis.	A68, A69, A70, A71	Adjust A68, A69 and A70 for maximum amplitude and symmetry similar to Fig. 6. If peaks or the tilt is excessive, knife A71 SLIGHTLY so as not to prevent loss of gain.
43.	"	"	177MC (10-15MC Swp)	175.25MC 179.75MC	7	"	A72, A73, A74	Adjust A72, A73 and A74 for maximum amplitude and symmetry similar to Fig. 6.
44.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check for response similar to Fig. 6 on all channels (7-13). If necessary, make compromise adjustments of A72, A73 and A74 for desired response on all high band channels.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
45.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A75, A76, A77	Adjust A75, A76 and A77 for maximum gain on response curve and flatness of top as in Fig. 7. Adjustment is made by knifing coil turns.
46.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A78, A79, A80	Check tracking on channel 5. If necessary, knife A78, A79 and A80 (Fig. 7). (Must not be over 15% off.)
47.	"	"	69MC (10MC Swp)	67.25MC 71.75MC	4	"	A81, A82, A83	Check tracking on channel 4. If necessary, knife A81, A82 and A83. (Fig. 7). (Must not be over 15% off.)
48.	"	"	63MC (10MC Swp)	61.25MC 65.75MC	3	"	A84, A85, A86	Check tracking on channel 3. If necessary, knife A84, A85 and A86 (Fig. 7). (Must not be over 15% off.)
49.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A87, A88, A89	Check tracking on channel 2. If necessary, knife A87, A88 and A89 (Fig. 7). (Must not be over 15% off.)

IF INTERFERENCE TRAP ALIGNMENT

A90 is aligned at the factory for approximately 43.5MC. A90 may be readjusted in the field to eliminate any interference between the 40-50MC range.
When adjusting this trap core, care should be exercised so that normal channel 2 response is not affected. Adjust A90 for MINIMUM IF channel interference pattern on screen.

40MC CHANNEL ALIGNMENT OF VHF TUNER RJX-087

Connect bias as under "Video IF Alignment".
Remove IF output link at junction of L11 and C35 and terminate with a 68Ω carbon resistor at open end.
Set tuner knob to "UHF" position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
50.	Fig. 8	High side thru (Fig. 8) network to point (G). Low side to tuner chassis.	620MC (20MC Swp)	40.5MC 45.75MC	Any UHF channel	Vert. amp. thru 10K to point (F). Low side to chassis.	A91, A92, A93	Adjust for cresponse curve similar to Fig. 9. Adjust A91 and A92 for maximum amplitude. Adjust A93 for maximum gain and zero tilt. Do not allow coils to touch. Disregard possibility of notch caused by the IF trap (A90). Reconnect IF output link to junction of L11 and C35.

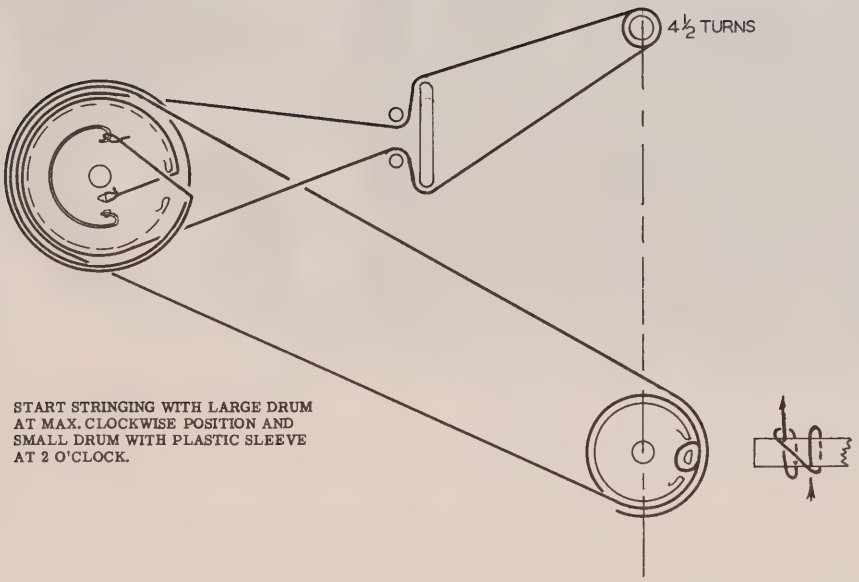
UHF TUNER ALIGNMENT

This portion has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

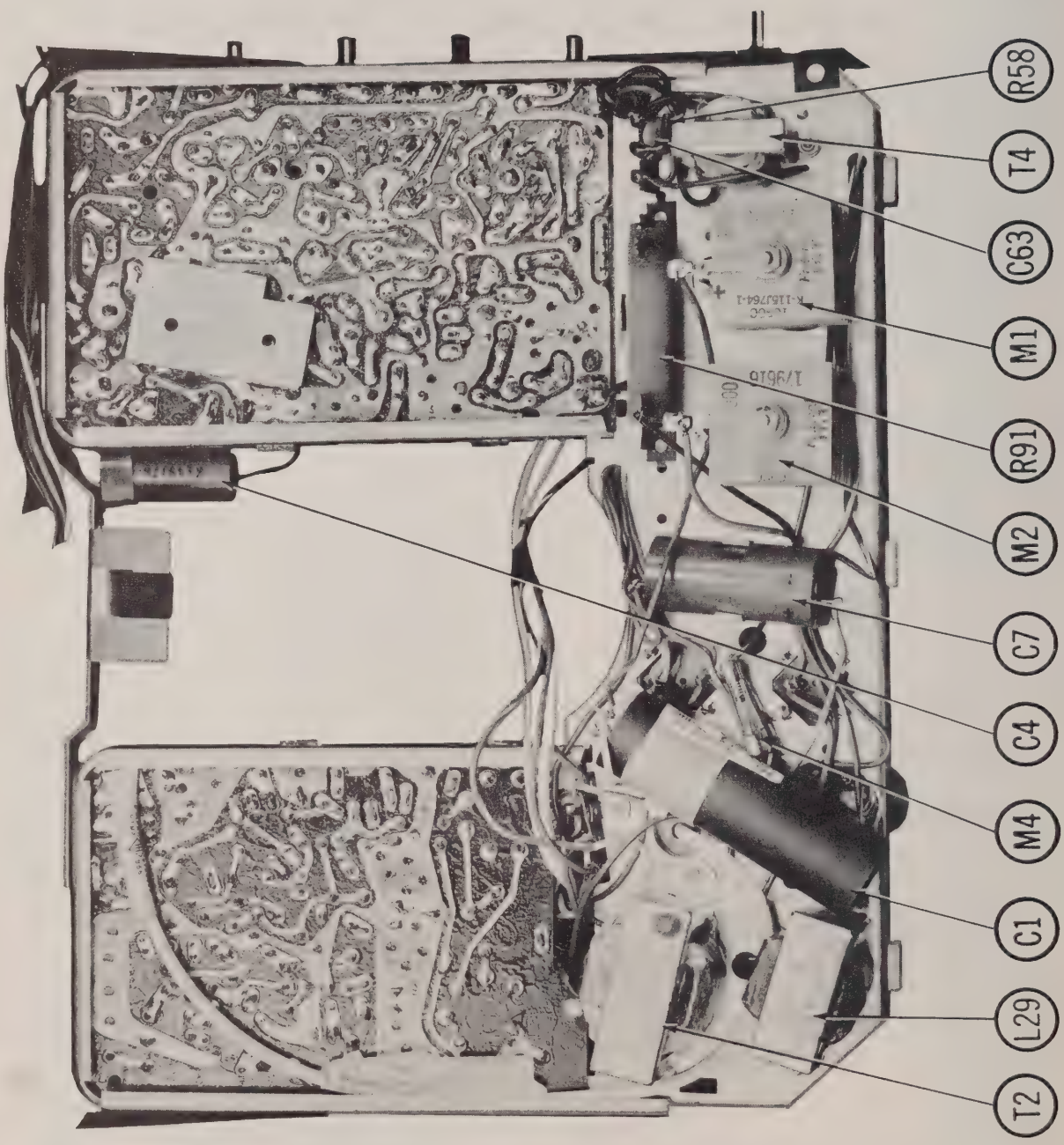
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	6Meg	0Ω	1Ω	2Ω	†37Ω	■22K	0Ω		
V2	5BE8	15K	■4700Ω	0Ω	0Ω	1Ω	■.5Ω	■0Ω	0Ω	270K
V3	3AU6	2.5Meg	0Ω	10Ω	9Ω	▲47Ω	▲47Ω	47Ω		
V4	3AU6	270K	INF	10Ω	11Ω	†270Ω	†270Ω	▲47Ω		
V5	3CB6	0Ω	180Ω	12Ω	13Ω	■220Ω	■220Ω	0Ω		
V6	6AU8	0Ω	3Meg	†330K	12Ω	14Ω	82Ω	1Meg	■0Ω	†4700Ω
V7	3AU6	68K	0Ω	5Ω	6Ω	■330Ω	■330Ω	180Ω		
V8	5T8	INF	22K	INF	6Ω	8Ω	5Meg	0Ω	6.8Meg	†720K
V9	12CA5	70K	■250K	9Ω	8Ω	■250K	†270Ω	†500Ω		
V10	6CM7	*2400Ω	NC	0Ω	16Ω	18Ω	†3.5Meg	850K	2.7Meg	0Ω
V11	6CG7	†15K	2.2Meg	910Ω	5Ω	4Ω	†80K	47K	910Ω	0Ω
V12	12BQ6GTA	TP	21Ω	NC	†12.5K	1Meg	NC	18Ω	0Ω	TOP CAP *28Ω
V13	12AX4GTA	NC	NC	60K	NC	†33Ω	NC	21Ω	24Ω	
V14	1X2A	PINS 1 - 8 HAVE INFINITE RESISTANCE								TOP CAP *400Ω
V15	17AVP4A	17Ω	47K	Pin 6 47K	Pin 10 *750K	Pin 11 ■350K	Pin 12 15Ω			

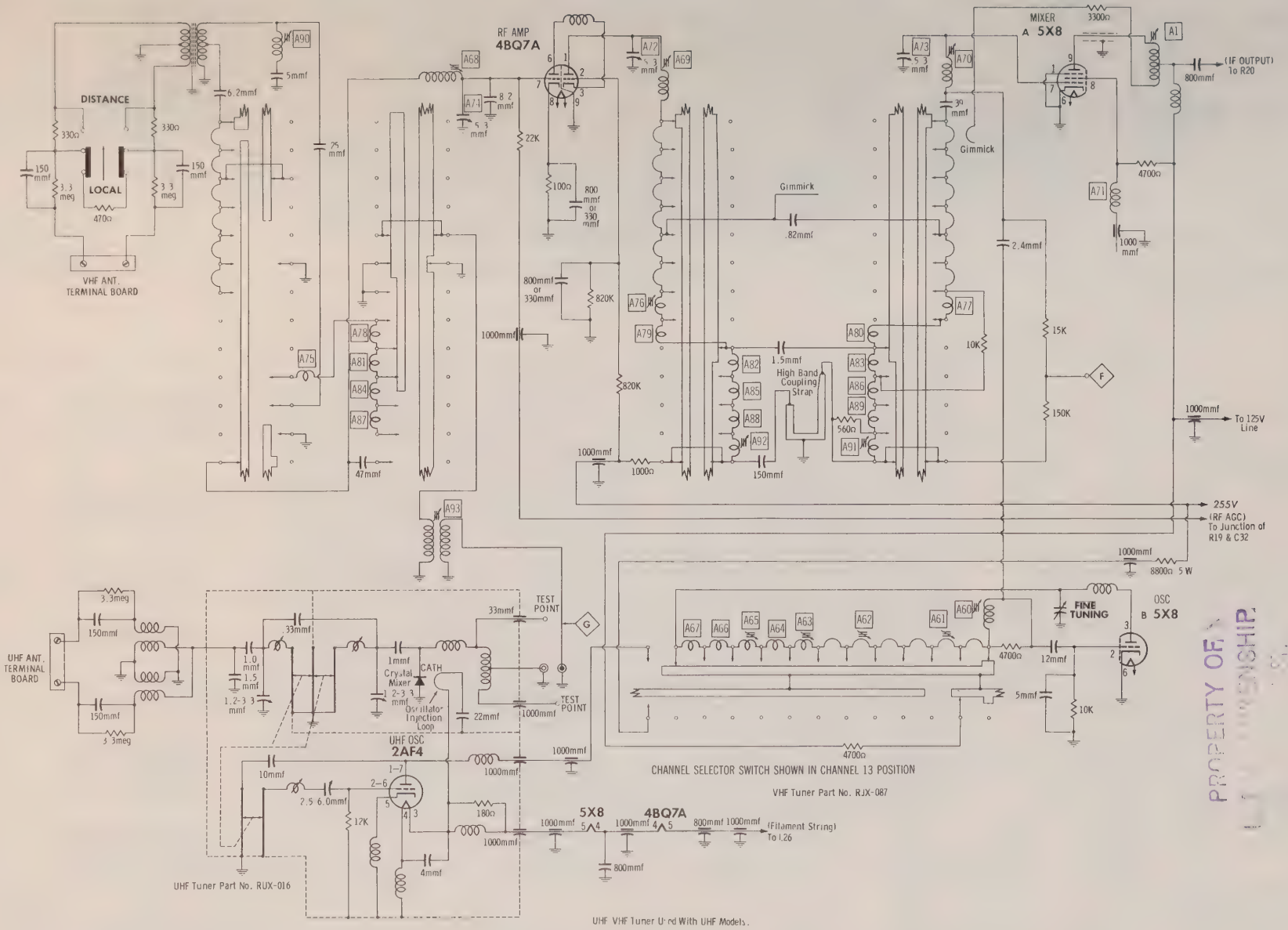
† MEASURED FROM OUTPUT OF M2.
* MEASURED FROM PIN 3 OF V13.
■ MEASURED FROM 125V LINE.
▲ MEASURED FROM PIN 2 OF V4.
NC NO CONNECTION
TP TIE POINT



UHF DRIVE CORD STRINGING



CHASSIS BOTTOM VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ALTERNATE VHF-UHF TUNER SCHEMATIC

HOTPOINT MODELS
17S301, 17S302 ("MM" Line)

PROPERTY OF

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	3BC5	
V2	Mixer Osc.	3BE6	Note 1
V3	1st Video IF Amp.	3AL5	
V4	2nd Video IF Amp.	3AU6	
V5	3rd Video IF Amp.	3CB6	
V6	Video Output - Sync Sep.	6AU8	
V7	Sound IF Amp.	3AU6	

ITEM No	USE	TYPE	NOTES
V8	Ratio Det - AF Amp - AGC Clamper	5T8	
V9	Audio Output	1BC45	
V10	Vert. Mult - Vert. Output	6CM7	
V11	Horiz. Mult.	6CG7	
V12	Horiz. Output	12BQ6GTA	
V13	Damper	12AX4GTA	
V14	HV Rectifier	1X2A	

Note 1: Alternate tube no. 5CL8. Tuner TJX-088 may use either tube. These two tubes should not be interchanged unless necessary. Interchanging will require complete tuner realignment.

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	HOTPOINT PART No	CBS PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	
V19	17AVP4A	17AVP4A ①	17AVP4A ①	17AVP4A ② 17AVP4	① Aluminized ② Silver Screen 68

ELECTROLYTIC CAPACITORS

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA HOTPOINT PART No	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No	NOTES
C1	30	150	RCE-233	AF181-23	XA0281	FP117	TM5-25	T-050	TVL-1429	
C2	120	350	RCE-234	AF181-43	XA0441	FP140	TM5-46	S-230	TVL-1538	
C3A	4150	300	RCE-235	AF182-52-55	D0370	FP237, 7		Q-013	R3239*	
B	4100	150			BR10015	TC68		MT-15100		
C4	100	.0	RCE-237*	PR813V100	BR1031	TC3501	TD-100-15	MTH-1210	TVA-U130	
C5	4	50	RCE-236	PR815G4	BR844-50			MT-0504	R3238*	
C6	30	150	RCE-233	AF81-31	XA0341	FP116	TM5-22	S-090	TVL-1423	
C7	40	350	RCE-233	PR8540V40	BR4035	TC78	TD-40-350	FM-4540	TVA-1151	

* No catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA HOTPOINT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C8	150	500	UCG-032	DI-00015	DD-151	SWST15	ED-150	MC226	1FM-315	
C9	150	500	UCG-032	DI-00015	DD-151	SWST15	ED-150	MC226	1FM-315	
C10	5		RCH-3113	NPO-D15		ZOII	TCO-5	ZT-555		
C11	18		RCH-3266							
C12	1000		RCH-3269							
C13	1000		RCH-3267	BPD-001	DD-103	KD69	ED-001	DC521	5HK-D1	
C14	47		RCH-3267	NT10-D647	TCM-47	MD33	TCT-47	NT-5647	5TCU-Q47	
C15	1000		RCH-3269							
C16	38									
C17	24									
C18	1.5		RCH-3028							
C19	15		RCH-3271	NPO-D15	TCE-15	ZO2I	TCO-15		5TCC-Q15	
C20	15		RCH-3270							
C21	100		RCH-3273							
C22	10									
C23	10		RCH-3004	NPO-E10	TCE-10	TE00	TCO-10	NT-546	5TCC-Q1	
C24	1.5		RCH-3025							
C25	1000		RCH-3266							
C26	1000		RCH-3269							
C27	1000		RCH-3269							
C28	1.5		RCH-3270							
C29	1000		RCH-3273	BPD-001	DD-102	KD69	ED-001	DC521	5HK-D1	
C30	1000		RCH-3213	BPD-301	DD-103	KD69	ED-001	DC521	5HK-D1	
C31	1000		RCH-3269							
C32	27	200					ACE8022	28E-P22		
C33	10000		RCH-3247	BPD-03	DD-203	KD85	ED-02		5HK-S2	
C34	30	500	NPO-4E30	NPO-4E30	TCE-30	TE18	TCO-30	ZT-543	5TCC-Q43	
C35	800		RCH-3027	BPD-0008	DD-801	GO67	ED-0008		5GA-T8	
C36	.047	300						ACE4047	5GA-T8	
C37	800		RCH-3027	BPD-0008	DD-801	GO67	ED-0008	UC-5375	5GA-T8	
C38	800		RCH-3235	BPD-00068	DD-801	KD60	ED-880	UC-5368	5GA-T88	
C39	800		RCH-3027	BPD-0008	DD-801	GO67	ED-0008	UC-5375	5GA-T8	
C40	800		RCH-3027	BPD-0008	DD-801	GO67	ED-0008	UC-5375	5GA-T8	
C41	680		RCH-3232	BPD-00068	DD-681	KD60	ED-680	UC-5368	5GA-T68	
C42	800		RCH-3027	BPD-0008	DD-801	GO67	ED-0008	UC-5375	5GA-T8	
C43	750		RCH-3031	DI-00075	DD-751	GO66	ED-750	UC-5375	5GA-T75	
C44	800		RCH-3027	BPD-0008	DD-801	GO67	ED-0008	UC-5375	5GA-T8	
C45	5		RCH-3057	NPO-D15	TCZ-4R7	ZOII	TCO-5	ZT-555	5TCCB-V47	
C46	5		RCH-3057	NPO-D15	TCZ-4R7	ZOII	TCO-5	ZT-555	5TCCB-V47	
C47	.047	300						ACE4047	28E-S47	
C48	33		RCU-325	NPO-D133	TCZ-33	ZO39	TCO-33	ZT-5433	5TCC-Q33	
C49	680		RCH-3027	BPD-0008	DD-801	GO67	ED-0008	UC-5375	5GA-T8	
C50	47		RCH-3259	BPD-00047	DD-471	GO35	ED-470	UC-5447	5GA-Q47	
C51	800		RCH-3027	BPD-0008	DD-801	GO67	ED-0008	UC-5375	5GA-T8	
C52	1	400						ACE406	4SS-P1	
C53A	10000	1000	RCH-3264		DD-103				10HK-S1	
B	10000	1000			DD-103				10HK-S1	
C54	20		RCH-3173	NPO-D130	TCZ-20	ZO23	TCO-20	ZT-542	5TCC-Q20	
C55	47		RCH-3268	BPD-000047	DD-470	GO33	ED-47	UC-5447	5GA-Q47	
C56	5000		RCH-3014	BPD-005	DD-502	KD80	ED-005	DC525	5HK-D5	
C57	5000		RCH-3014	BPD-005	DD-502	KD80	ED-005	DC525	5HK-D5	
C58	800		RCH-3027	BPD-0008	DD-801	GO67	ED-0008	UC-5375	5GA-T8	
C59	5000			BPD-005	DD-502	KD80	ED-005	DC525	5HK-D5	
C60	10000		RCH-3186	BPD-01	DD-103	KD82	ED-01	DC511	5HK-S1	
C61	10000		RCH-3186	BPD-01	DD-103	KD83	ED-01	DC511	5HK-S1	
C62	10000		RCH-3186	BPD-01	DD-103	KD82	ED-01	DC511	5HK-S1	
C63	5000		RCH-3014	BPD-005	DD-502	KD80	ED-005	DC525	5HK-D5	
C64	5000		RCH-3014	BPD-005	DD-502	KD80	ED-005	DC525	5HK-D5	
C65	470		RCH-3234	51470	DH-471	TP48	GP-470	UC-5347	5GA-T47	
C66	.15	400	RCH-111	P488M-15		CUP4P15		GEM-4015	47M-P15	
C67	.015	1000								
C68	.033	600							68M-S15	
C69	.015	600								
C70	.0039	600								
C71	500		RCW-3184	BPD-0008	DD-801	GO67	ED-0008	UC-5375	5GA-T8	
C72	.015	1000							15M-S15	
C73	100		RCW-3238	BPD-DI100	DD-101	TZ30	TCD-100	ET-531	5TCC-T1	
C74	82		RCW-3237	1469-0050S2	TCZ-82	3329G82	TCO-82		M3-682	
C75	1200		RCW-3187	1464-0012		1N5D13	ED-1200		M5-B13	
C76	470		RCW-3248	BPD-00047	DD-471	ED40	ED-470		5GA-T8	
C77	1200		RCW-3187	1464-0012		1N5D13	ED-1200		M5-B13	
C78	5000		RCW-3188	BPD-005	DD-502	KD80	ED-005	DC525	5HK-D5	
C79	.1	300	RCH-116	P368M-1	DP-104	CUP3P1			5TM-P1	
C80	910	500	RCU-347	1464-0009R		1M5T91			M5-391	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA HOTPOINT PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C81	.0047	600								
C82	5000		RCW-3014	BPD-005	DD-502	K080	ED-005	DC525	5HK-D5	
C83	820		RCW-3262	BPD-0008	D8-821	G087	ED-820		5GA-T82	
C84	1	600								Note 1
C85	270	3000								
C86	10000		RCW-3186	BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C87	180	1500	RCW-3261		1X3A					
C88	800		RCW-3027	BPD-0008	DD-801	G067	ED-0008	UC-5375	5GA-T8	
C89	800		RCW-3027	BPD-0008	DD-801	G067	ED-0008	UC-5375	5GA-T8	
C90	800		RCW-3027	BPD-0008	DD-801	G067	ED-0008	UC-5375	5GA-T8	
C91	800		RCW-3027	BPD-0008	DD-801	G067	ED-0008	UC-5375	5GA-T8	
C92	800		RCW-3027	BPD-0008	DD-801	G067	ED-0008	UC-5375	5GA-T8	

Note 1: Some versions may use 2500MMF in this application. (Part no. RCW-3260)

CONTROLS

ITEM No	RATING RESIST ANCE	RATING WATTS	REPLACEMENT DATA HOTPOINT PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No	INSTALLATION NOTES
R1A	500K	1	KRC-378					Volume Control
B	Shaft		Not Req.					Attach to R1A
C	Switch		Not Req.					Attach to R1A
R2	200K	½	KRC-377					Brightness Control
R3	1.5Meg	½	KRC-380					Vertical Hold
R4	18K	½	KRC-379					Contrast Control (Trap① 1010)
R5	1Meg	½	KRC-383					Horizontal Hold
R6	500K	1/4	KRC-382					Height Control
R7	2Meg	1	KRC-381					Vertical Linearity

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA HOTPOINT PART No.	IRC PART No.	NOTES
R8	2.3Meg			BTS-2.3Meg	
R9	2.3Meg			BTS-2.3Meg	
R10	470Ω			BTS-470	
R11	330Ω			BTS-330	
R12	330Ω			BTS-330	
R13	15K			BTS-15K	
R14	22K			BTS-22K	
R15	4700Ω			BTS-4700	
R16	330K			BTS-330K	
R17	4700Ω			BTS-4700	
R18	15K			BTS-15K	
R19	2.2Meg				
R20	33Ω				
R21	75000 5%				
R22	2.2Meg				
R23	47Ω			BTS-47	
R24	47Ω			BTS-47	
R25	470K				
R26	470K				
R27	18K			BTS-220	
R28	220Ω			BTS-47	
R29	47Ω				
R30	18K				
R31	330Ω			BTS-330	
R32	180Ω			BTS-180	
R33	3900Ω				
R34	240K 5%				
R35	1Meg				
R36	5800Ω	2		BTS-5800	
R37	82Ω			BTS-82	
R38	3300Ω			BTS-3300	
R39	68K			BTS-68K	
R40	18K			BTS-18K	
R41	270K			BTS-270K	
R42	2.2Meg			BTS-2.2Meg	
R43	1.2Meg			BTS-1.2Meg	
R44	3.3Meg 5%				
R45	9.1Meg 5%				
R46	3.3Meg				
R47	3.9Meg				
R48	330Ω			BTS-330	
R49	180Ω			BTS-180	
R50	220Ω			BTS-220	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA HOTPOINT PART No.	IRC PART No.	NOTES
R51	22K			BTS-22K	
R52	6.8Meg			BTS-6.8Meg	
R53	680K			BTS-680K	
R54	470K 5%			BTS-470K 5%	
R55	1000Ω			BTS-1000	
R56	510K 5%			BTS-510K 5%	
R57	270Ω	1		BTA-270	
R58	1Meg			BTS-1Meg	
R59	22K			BTS-22K	
R60	470K			BTS-470K	
R61	330K			BTS-330K	
R62	47K			BTS-47K	
R63	100K			BTS-100K	
R64	3.3Meg			BTS-3.3Meg	
R65	68K			BTS-68K	
R66	47K			BTS-47K	
R67	1Meg			BTS-1Meg	
R68	680K			BTS-680K	
R69	150K			BTS-150K	
R70	33000				
R71	33000				
R72	15K			BTS-15K	
R73	47K			BTS-47K	
R74	560K				
R75	680K				
R76	100K				
R77	1.5Meg				
R78	56K				
R79	15K	1			
R80	47K				
R81	1.5Meg				
R82	82K				
R83	9000 5%				
R84	12K				
R85	1Meg				
R86	100Ω				
R87	12K	2		BTB-12K	
R88	270K	1			
R89	330K	1			
R90	2.2Ω		N-RHW-147	BW§-2.2	
R91	43Ω	25	N-RHW-148	2DA-25-92	
R92	7.5Ω	15	N-RHW-149	2DA-25-7.5	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA HOTPOINT PART No	Halldorson PART No	Merit PART No	RCA TYPE No.	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Horiz. Output Trans.	RTO-188							
T2	Vert. Output Trans.	RTO-189	21807 ①	A-2824 ①		9135 1* ③	A-8181 ②	26854 ②	A-1093B ②③
T3A	Yoke(90°) Horiz(15.3MH)	RLD-071 ④⑤	DF9504 ⑤	MDF-91 ⑤	237DH ⑤	Y315 ①	DY-13A ④⑤	Y-14 ⑤	Y-40-1
B	Vert(32MH)	RLD-078 ④⑤				T90F12/47 ⑤		Y-14 ⑤	
		RMC-088 ⑤							
		RBH-013 ⑤							

① Cut and tape blanking winding lead.
② Drill new mounting hole(s).
③ Connect as auto. trans.
④ Used in early production only.
⑤ Does not include clamp or retaining ring.
⑥ Used in later production.
⑦ Includes clamp and retaining ring.
⑧ Yoke clamp.
⑨ Yoke clamp retaining ring.
⑩ Requires new clamping device.
⑪ Connect horiz. yoke term #3 to horiz. output trans. term #2; connect horiz. yoke term #1 to horiz. output trans. term #1.
⑫ Connect horiz. yoke damping network across terms #3 and #7.
§ Use original mounting bracket.
* This part may be superseded by Parts Manufacturer's introduction of special unit for this application.

* HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
4		3					
5		4					
2		2					
1		1					
3		4					
Special Note ④		④					

④ Change value of resistor R87, if necessary, to remove drive lines.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI	IMPEDANCE SEC	REPLACEMENT DATA HOTPOINT PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T4	3.7K	3-4Ω	RTO-178	21105 ①②	A-3031 ① ③		23846 ①	S-16X ①②	① Drill one new mtg. hole. ② Tape unused hum-reducing tap.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V C IMP	REPLACEMENT DATA HOTPOINT PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	ROP-035	4A07	

COILS (RF-IF)

ITEM No.	USE	HOTPOINT PART No	NOTES
L1	Ant. Trans.	RLA-046	
L2	Ant. Coils	RSA-068	
L3	RF Coils	RSA-089	Includes C18
L4	Mixer Grid Coils	RSA-070	Includes C17 & C18

ITEM No.	USE	HOTPOINT PART No	NOTES
L5	Osc. Coils	RSA-071	Includes L6
L6	Osc. Coil	RLJ-373	Channel 6
L7	Osc. Coil	RLJ-372	Channel 13
L8	RF Choke	RLJ-376	
L9	Conv. Plate	RLJ-374	

ITEM No	USE	DC RES PRI.	DC RES SEC.	HOTPOINT PART No	MEISSNER PART No.	MERIT PART No.	MILLER PART No	NOTES
L10	47.25MC Trap	0Ω		RLJ-364				
L11	RF Choke	0Ω		RLJ-360				.1 Microhenry
L12	1st Video IF	0Ω		RLJ-361				
L13	2nd Video IF	.1Ω	.1Ω	RTL-194	17-6014			
L14	3rd Video IF	.1Ω	.1Ω	RTL-195	17-6014			
L15	4th Video IF	.1Ω		RLJ-362				
L16	Shunt Peaking Coil	0Ω		RLJ-301				.22 Microhenry
L17	Series Peaking Coil	2.2Ω			19-3036			31 Microhenries
L18	Series Peaking Coil	4.9Ω		RLJ-340	19-1004		6610	5.8 Microhenries; IRC part #C1A
L19	Shunt Peaking Coil	11.5Ω		RLJ-367	19-4400		6136	430 Microhenries
L20	Series Peaking Coil	4.5Ω		RLJ-307	19-1100	TV-181	6113	100 Microhenries
L21	Fil. Choke	1.8Ω		RLJ-122	19-1002		4606	2.2 Microhenries; IRC part #C1A
L22A	4.5MC Trap	3.3Ω		RLJ-363				
B	Sound IF	2.7Ω						
L23	Shunt Peaking Coil	16Ω		RLJ-366	19-4950			820 Microhenries
L24	Series Peaking Coil	8.5Ω		RLJ-315				300 Microhenries
L25	Ratio Det.	4.8Ω	1.9ΩCT	RTD-035	17-5400			Tertiary winding = .5Ω
L26	Fil. Choke	1.8Ω		RLJ-122	19-1002		4606	2.2 Microhenries; IRC part #C1A
L27	RF Choke	8.3Ω		RLJ-153	19-1008		4613	10 Microhenries; IRC part #C1-1.

TRANSFORMER (HORIZ. OSC.)

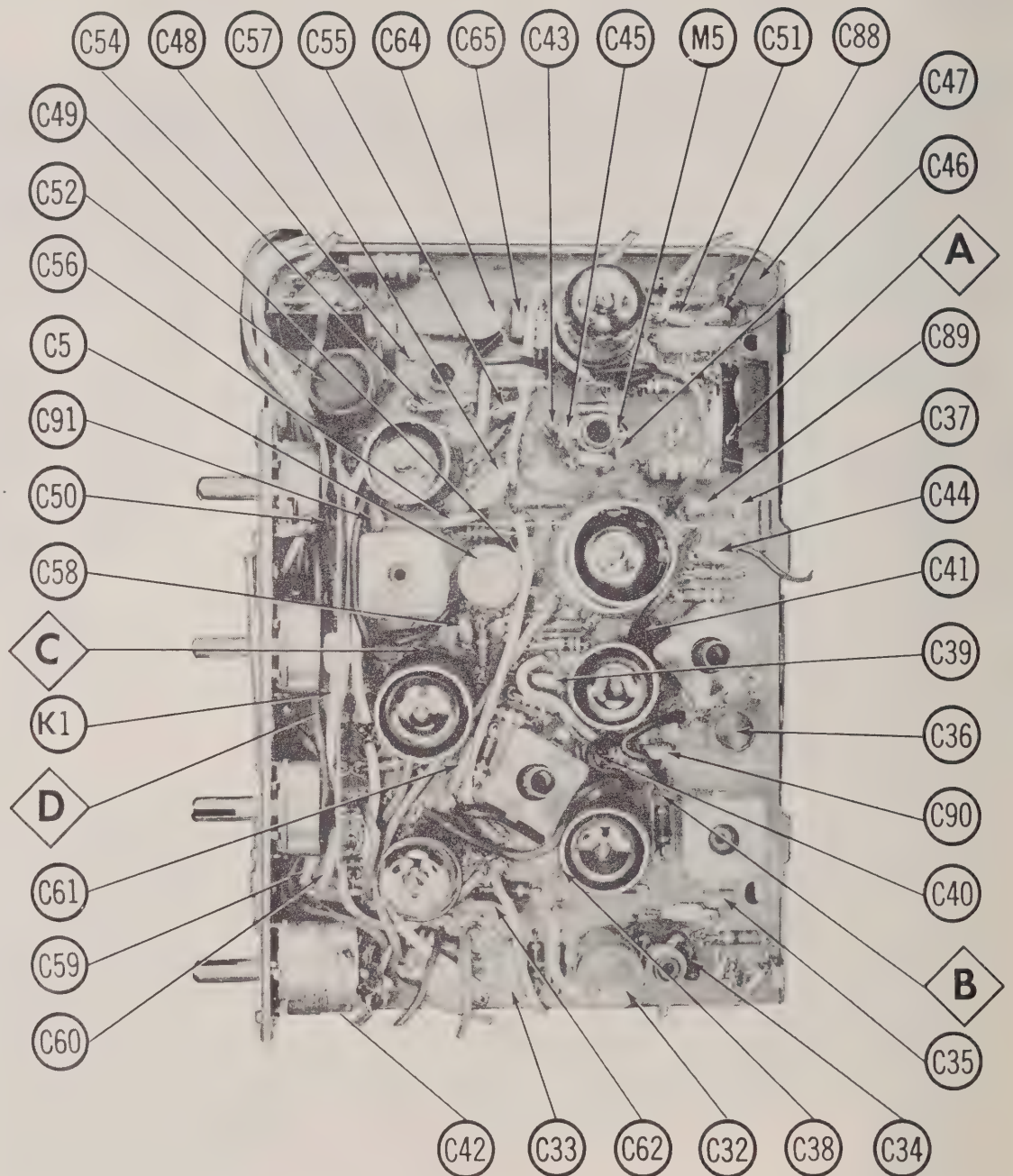
ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA HOTPOINT PART No	MEISSNER PART No	MERIT PART No	MILLER PART No	RCA TYPE No	Ram PART No	Thordarson PART No	NOTES
L28	78Ω		RLJ-365							

FILTER CHOKE

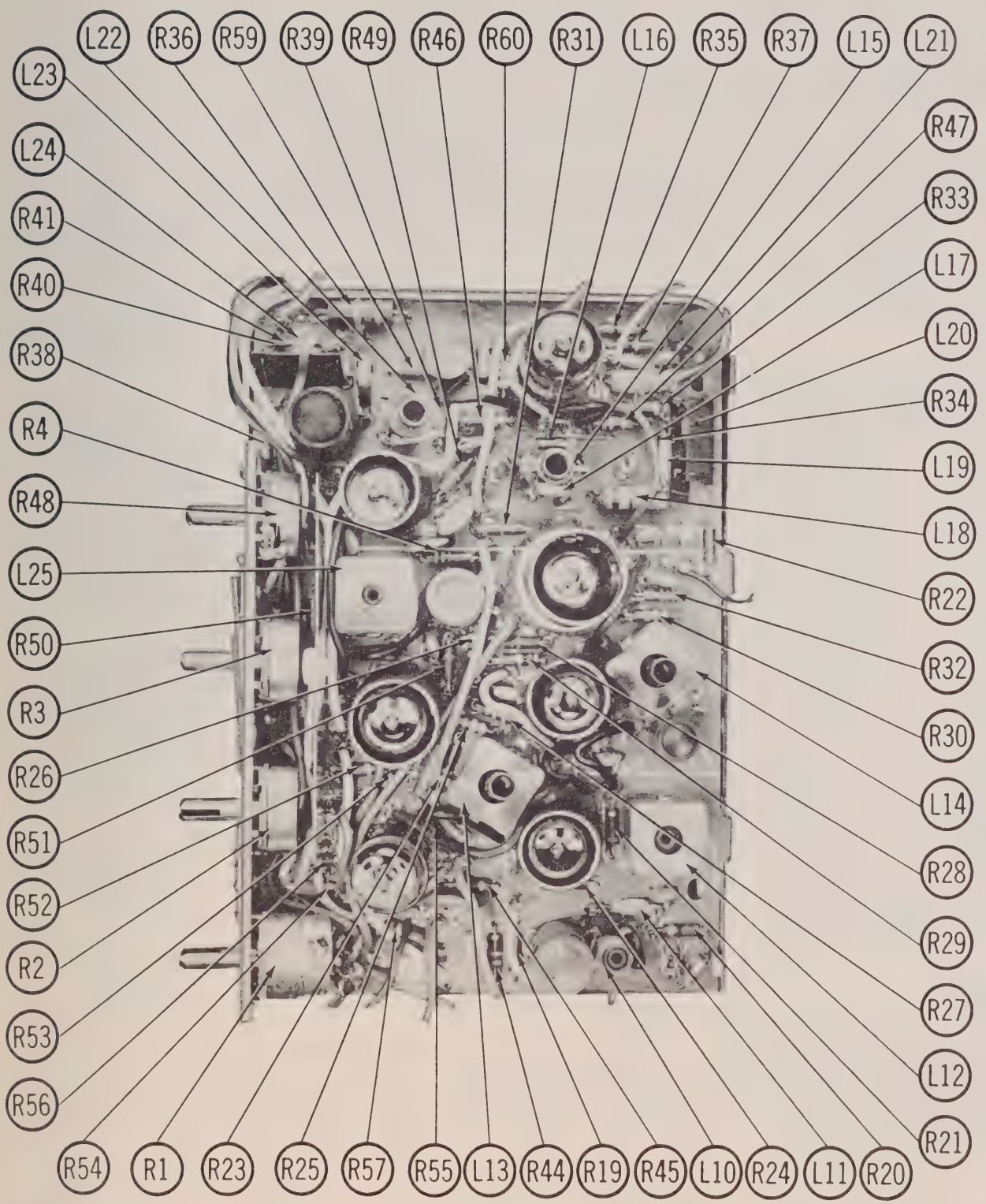
ITEM No	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 °(L)	REPLACEMENT DATA HOTPOINT PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
L29	.210A	37Ω	1HY	RLF-073	C5040	C-2994	C-3337	28C41	

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	HOTPOINT PART No	REPLACEMENT DATA Aerovox Centralab	REPLACEMENT DATA PA435 PC-186
K1	De-emphasis Network	22K, 1000MMF, 4000MMF, 10000MMF	RKK-013		
K2	Vertical Integrator	15K, 68K, 100K, 900MMF, 2000MMF	RKK-013		



SOUND IF & VIDEO IF PRINTED CIRCUIT CAPACITOR IDENT.



SOUND IF & VIDEO IF PRINTED CIRCUIT RESISTOR IDENT.

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	HOTPOINT PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.210A	RER-015	1238A	MR350	6S300	5QS1	350A	
M2	.210A	RER-015	1238A	MR350	6S300	5QS1	350A	

SELENIUM DIODE

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	HOTPOINT PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M3		RER-023		1T1 ①				① 2 required.

FUSES

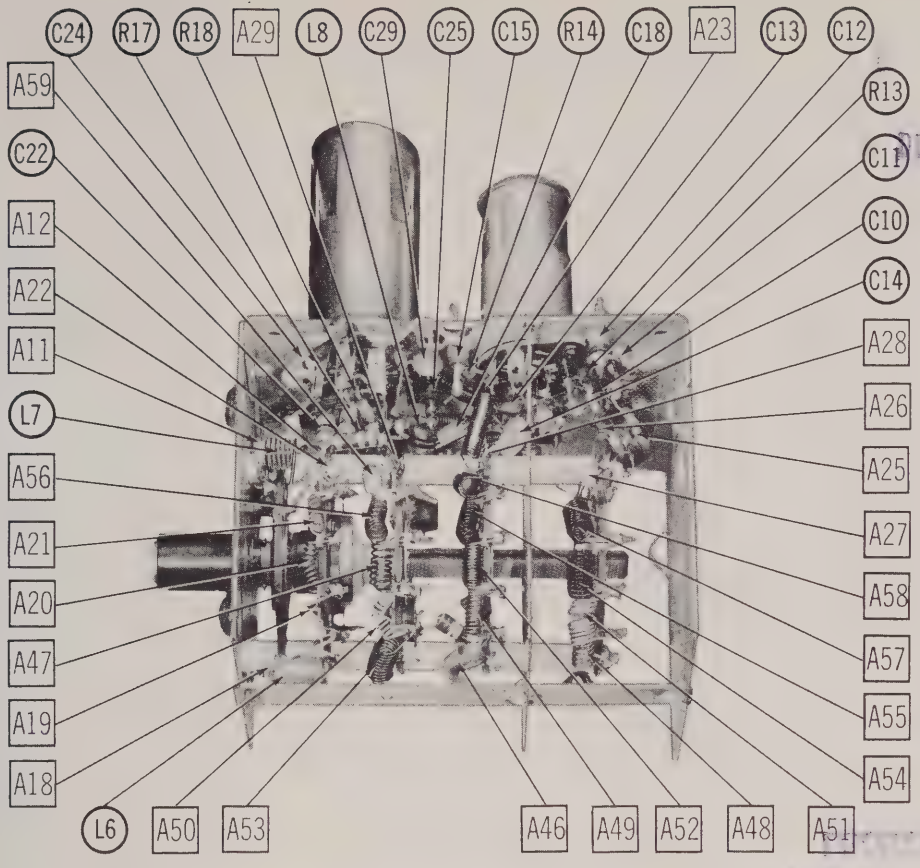
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			HOTPOINT PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M4	3AG P/T S/B	2A			315002. (3AG-P/T-S/B-2A)		MDV2	

CRYSTAL DIODES

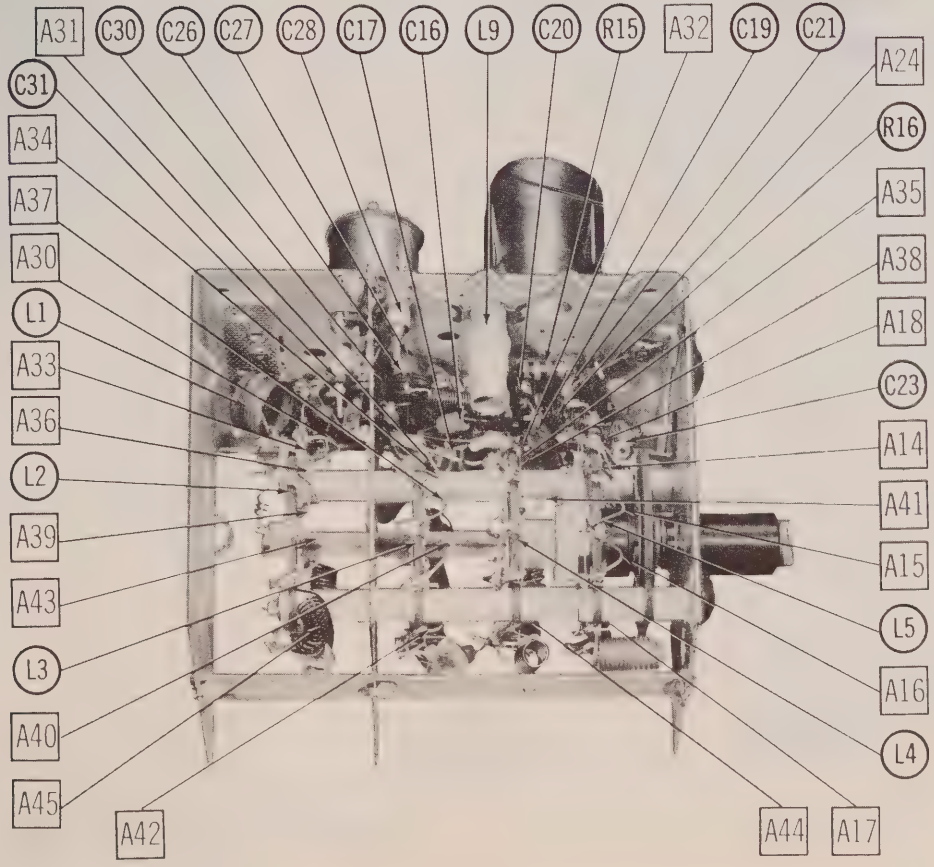
ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		HOTPOINT PART No.	SYLVANIA PART No.	
M5	1N87G	RED-001	1N60	(Pigtail)

MISCELLANEOUS

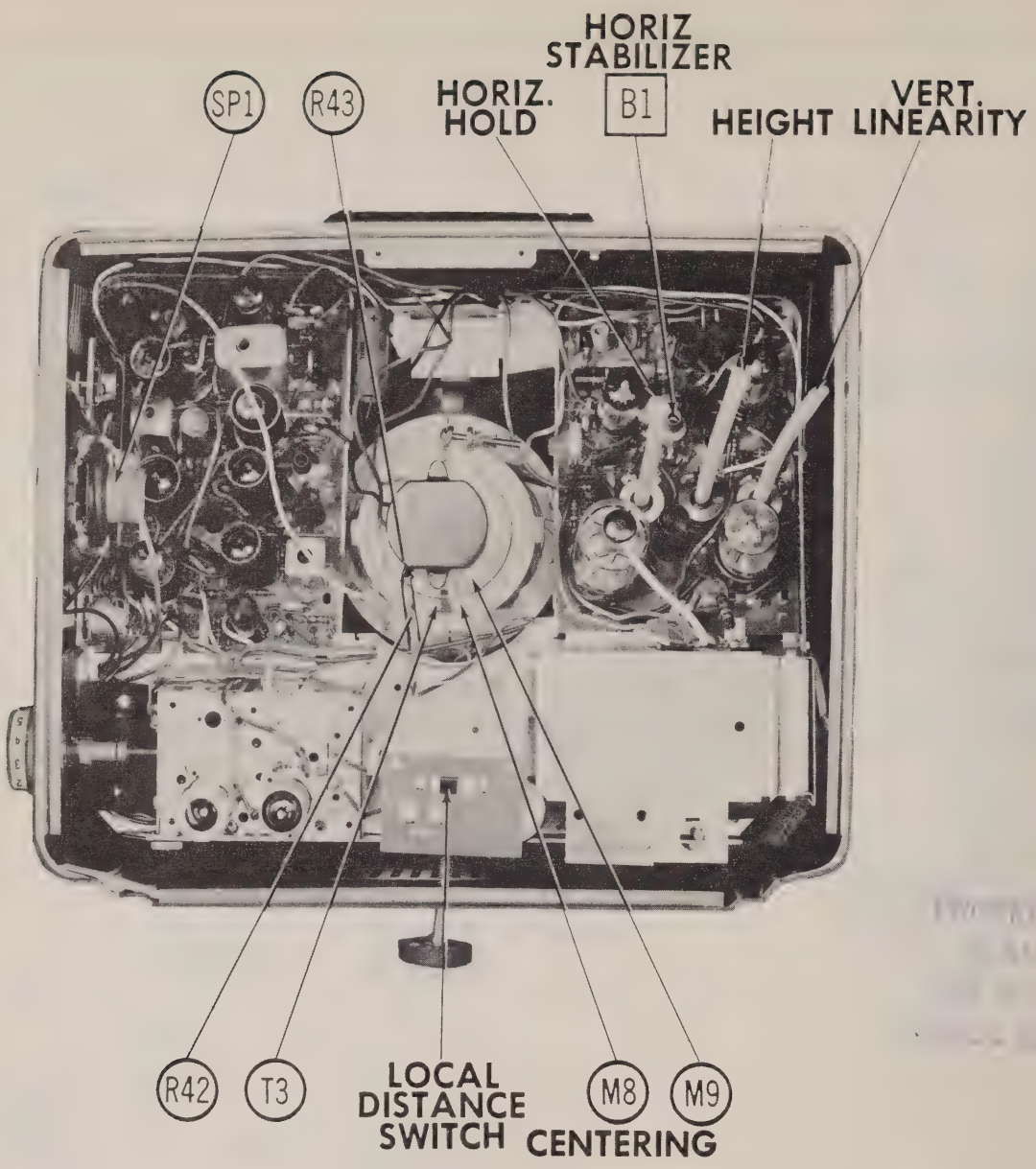
ITEM No.	PART NAME	HOTPOINT PART No.	NOTES
M6	Tuner	RJX-086	VHF - Used in VHF Models.
	Tuner	RJX-087	VHF - Used in UHF-VHF Models.
	Tuner	RUX-016	UHF - Used in UHF-VHF Models.
M7	Switch	RSS-011	Local-Distant, (DPDT - Slide Type)
M8	Centering Device	REA-013	
M9	Ion Trap	RET-010	
	Cabinet	HAC-001	Front, Model 17S301
	Cabinet	HAC-002	Front, Model 17S302
	Cabinet	HAV-001	Body, Model 17S301
	Cabinet	HAV-002	Body, Model 17S302
	Knob	HDK-001	4 Required
	Knob	HDK-002	VHF Selector
	Knob	HDK-003	UHF Selector
	Knob	HDK-004	UHF Dial
	Knob	RDK-530	Fine Tuning
	Handle	HHY-001	
	Safety Glass	RDW-113	



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn set on and tune in a TV station, preferably with a test pattern.

2. Short point Ⓗ to chassis with a clip lead.

3. Connect a 1000Ω resistor across horizontal stabilizer coil (L28).

4. Adjust horizontal hold control so that picture floats back and forth across screen.

5. Remove the resistor from across L28 and adjust B1 (horizontal stabilizer) so that the picture again floats back and forth across screen.

6. Remove clip lead from point Ⓗ to chassis. Readjust the horizontal hold control slightly if necessary.

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

MAGNAVOX CHASSIS U21-01AA, U21-02AA, U21-03AA, U21-04AA, V21-02AA, V21-03AA, V21-04AA

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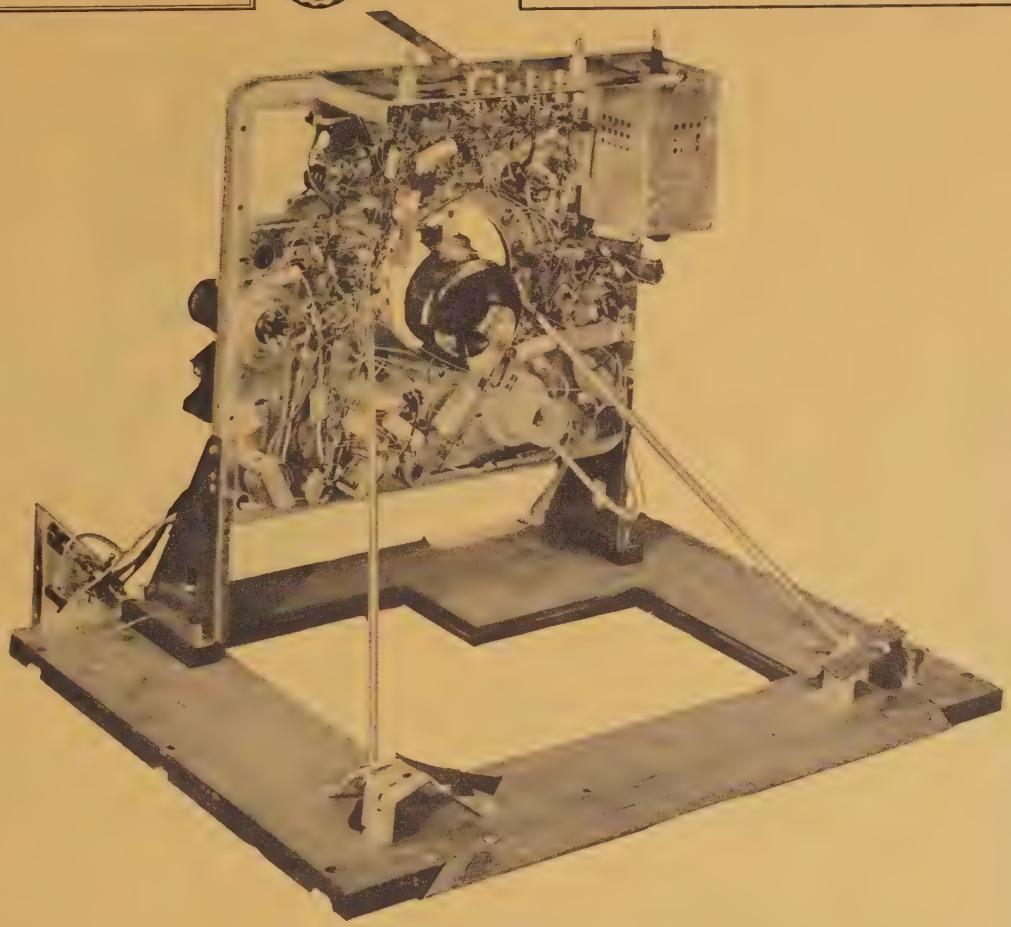

MAGNAVOX CHASSIS V21-02AA

TRADE NAME	Magnavox, Chassis: U21-01AA, U21-02AA, U21-03AA, U21-04AA, V21-01AA, V21-02AA, V21-03AA, V21-04AA
MANUFACTURER	Magnavox Co., 2131 Bueter Road, Ft. Wayne 4, Indiana
TYPE SET	Television Receiver
TUBES	Eighteen
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING 1.56 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13VHF, 13 thru 83UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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MAGNAVOX CHASSIS U21-01AA, U21-02AA, U21-03AA, U21-04AA, V21-02AA, V21-03AA, V21-04AA

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PHOTOFACT* Folder
*TRADE MARK

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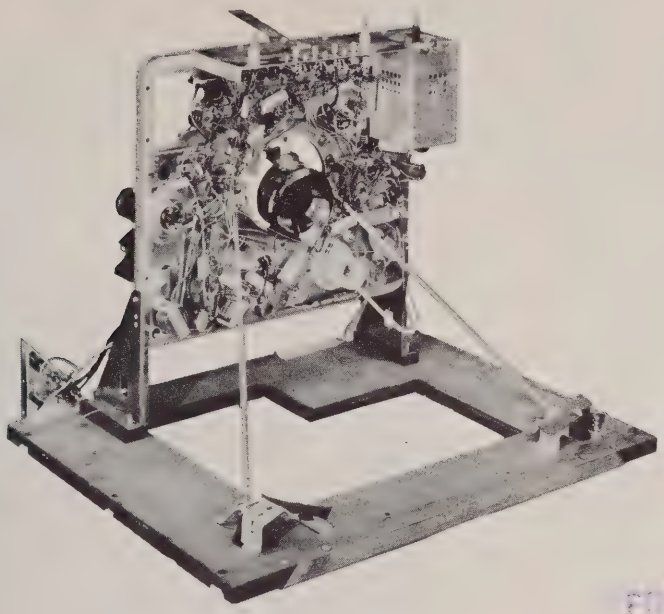

CHASSIS

V21-02AA

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator it is necessary to remove the rear cover and supply power to the set. Set the horizontal hold control at its mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

FOCUS

Focus may be varied by changing jumper on focus board. Adjust ion trap for best focus consistent with maximum brightness.

FUSES

One fuse is used for Horiz. Sweep Circuit protection. (For location see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Set the horizontal hold control to its mid-range position.

Turn the horizontal frequency slug (B1) slowly clockwise while switching off and on channel until the picture just loses sync.

Turn B1 counter clockwise until the picture regains sync, then continue $\frac{1}{2}$ turn in the same direction.

The picture should hold sync at both extreme ends of the horizontal hold control rotation.

If necessary, readjust B1 SLIGHTLY and test for sync or pull-in as above.

Adjust the width slug (B2) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.

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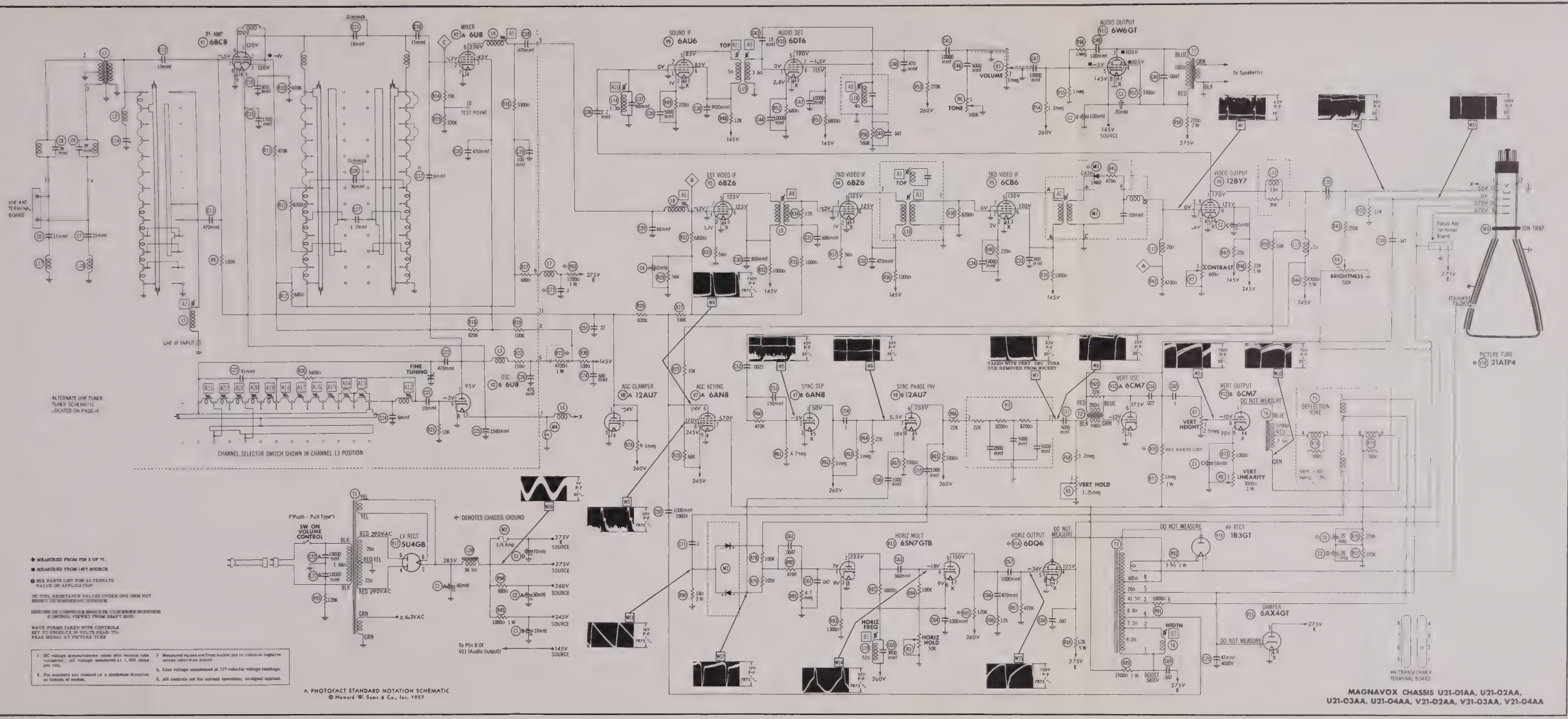
G773

DATE 2-57 SET 347 FOLDER 7

MAGNAVOX CHASSIS U21-01AA, U21-02AA, U21-03AA, U21-04AA, V21-02AA, V21-03AA, V21-04AA


MAGNAVOX CHASSIS U21-01AA, U21-02AA,
U21-03AA, U21-04AA, V21-02AA, V21-03AA, V21-04AA
RF AMP V1 6BC8
MIXER V2 A 6U8
SOUND IF V5 6AU6
AUDIO DET V10 6DT6
AUDIO OUTPUT V11 6W6GT
1ST VIDEO IF V3 6BZ6
2ND VIDEO IF V4 6BZ6
3RD VIDEO IF V5 6CB6
VIDEO OUTPUT V6 12BY7
OSC V2 B 6U8
AGC CLAMPER V8 A 12AU7
AGC KEYING V7 A 6AN8
SYNC SEP V7 B 6AN8
SYNC PHASE INV V8 B 12AU7
VERT OSC V12 A 6CM7
VERT OUTPUT V13 B 6CM7
HORIZ MULT V13 6SN7GTB
HORIZ OUTPUT V14 6DQ6
HV RECT V16 1B3GT
DAMPER V15 6AX4GT
LV RECT V17 5U4GB
PICTURE TUBE V18 21ATP4
ALTERNATE UHF TUNER
TUNER SCHEMATIC
LOCATED ON PAGE 14
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
UHF IF INPUT
VHF ANT TERMINAL BOARD
TEST POINT
FINE TUNING
VOLUME
TONE
CONTRAST
BRIGHTNESS
VERT HEIGHT
VERT LINEARITY
HORIZ FREQ
HORIZ HOLD
WIDTH
BOOST
VERT HOLD
ION TRAP
DEFLECTION YOKE
Focus Adj Terminal Board
HV TRANSFORMER TERMINAL BOARD
SW ON VOLUME CONTROL
("Push - Pull Type")
DENOTES CHASSIS GROUND
To Pin 8 Of V11 (Audio Output)
To Speaker(s)
145V SOURCE
275V SOURCE
260V SOURCE
245V SOURCE
DO NOT MEASURE
TAKEN WITH VERT. OSC. TUBE (V12) REMOVED FROM SOCKET
◆ MEASURED FROM PIN 5 OF V1.
■ MEASURED FROM 145V SOURCE
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN IN SCHEMATIC DIAGRAM
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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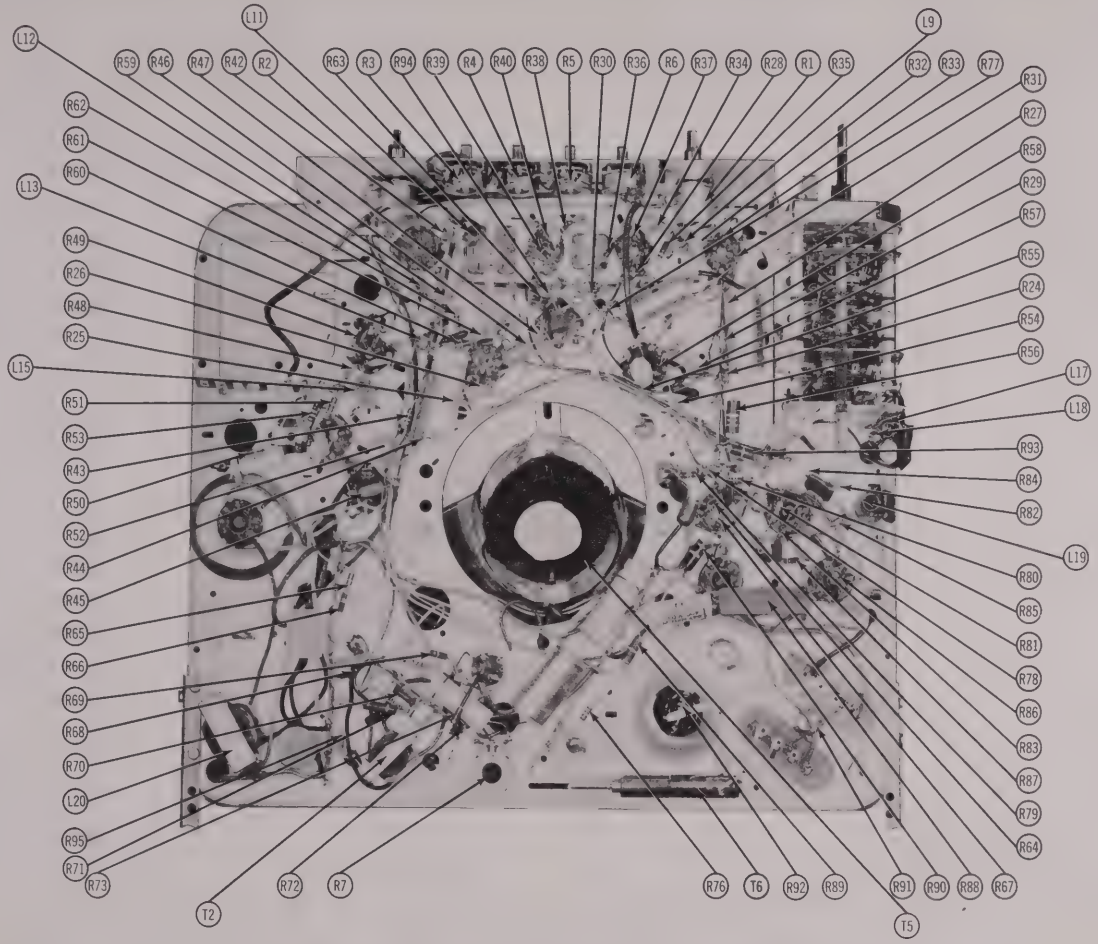
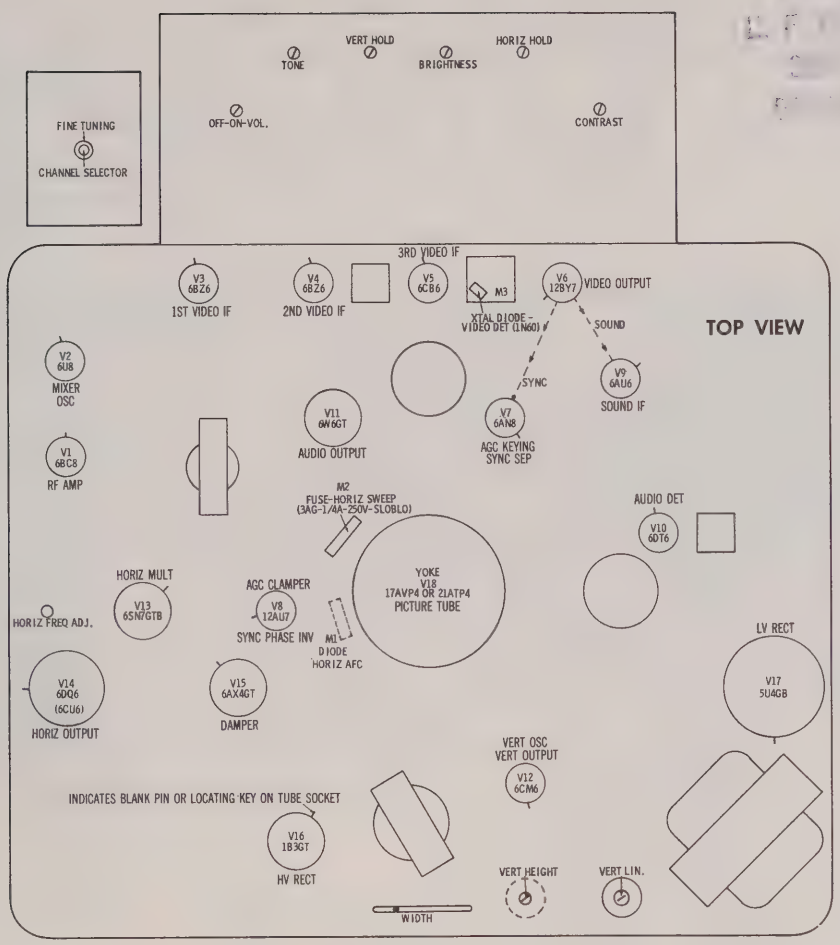
MAGNAVOX CHASSIS U21-01AA, U21-02AA,
U21-03AA, U21-04AA, V21-02AA, V21-03AA, V21-04AA



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V17**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, Diode (M3), V6, V18, V11**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V18**
Has pic, no sound - **V9, V10, V11**
Overloaded picture - **V7**

SYNC FAILURE
No vert. sync - **V7, V8, V12**
No horiz. sync - **V7, V8, Rectifier (M1), V13**
No vert. or horiz. sync - **V7, V8**

SWEEP FAILURE
No raster, has sound - **V13, V14, V15, V16, V17, Fuse (M2)**
No vertical deflection - **V12**
Poor vert. linearity or foldover - **V12**
Poor horiz. linearity or foldover - **V13, V14, V15**
Narrow picture - **V13, V14, V15, V17**
Vert. off freq. - **V7, V8, V12**
Horiz. off freq. - **V7, V8, M1, V13**

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Do not remove the horizontal oscillator tube (V13) to disable the high voltage. The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 1. 5 volt bias battery to the ungrounded side of C51. Connect the negative lead of a 3 volt bias battery to the ungrounded side of C4. Connect both positive leads to chassis. Set the local-distant switch to local position and the contrast control fully counter clockwise. Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	. 001MFD	High side to point Ⓑ. Low side to chassis.	43MC (10MC Swp)	47. 25MC	Any non-interfering channel.	Vert. amp. thru 10K to point Ⓐ. Low side to chassis.	A1	Adjust to place marker in trap notch as in Fig. 1. Use enough sweep generator output so that trap notch is plainly visible on scope. It is possible to obtain two settings of A1. The correct setting is with the core farthest out of the coil form.
2.	"	"	"	42. 75MC 45. 0MC 45. 75MC 47. 25MC	"	"	A2, A3, A4	Adjust A2 for maximum response between 42. 75MC and 45. 75MC. Adjust A3 to place 45. 75MC marker at 45% on response curve. Adjust A4 to place 42. 75MC marker at 60% on response curve. (See Fig. 2) Recheck A1 trap (47. 25MC).
3.	"	High side to point Ⓒ. Low side to chassis.	"	42. 75MC 45. 75MC	"	"	A5, A6	Adjust A5 for maximum gain while placing 45. 75MC marker at 45% on response curve as in Fig. 2. Adjust A6 for maximum gain and overall response with proper tilt. It may be necessary to alternately adjust A5 and A6 several times to obtain response within limits as shown in Fig. 2.
4.	1K resistor	High side to point Ⓓ thru 1K. Low side to chassis.	43MC (10MC Swp)	42. 75MC 45. 0MC 45. 75MC	Any unused UHF channel.	"	A7	Set VHF to UHF position. Adjust A7 for MINIMUM tilt on response curve as in Fig. 2. This adjustment need be made only when UHF-VHF tuner is used in set.

SOUND IF ALIGNMENT

Set contrast control to maximum.
Tune the receiver to a strong local station and adjust for maximum volume and MINIMUM distortion.
Reduce the signal input by disconnecting antenna or placing an attenuator between the antenna and the antenna terminals, so that with the volume control turned to maximum, the sound is barely audible. Adjust A9 for MINIMUM noise and clearest sound.
With the same weak signal input, adjust A10 and A11 for MINIMUM distortion and clearest sound.
Reduce the signal input further until noise is present and retouch A9 for MINIMUM noise and clearest sound.

VHF OSCILLATOR ALIGNMENT

If a separate signal generator is used as a marker generator, loosely couple it to the antenna terminals.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Fig. 3	Thru matching network (Fig. 3) to antenna terminals.	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 10K to point Ⓐ. Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should fall at 50%. See Fig. 5 for adjustments.
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A13	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A14	
			195MC (10MC Swp)	193. 25MC 197. 75MC	10		A15	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A16	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A17	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A18	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A19	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A20	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A21	
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A22	
			57MC (10MC Swp)	55. 25MC 59. 75MC	2		A23	

RF AND MIXER ALIGNMENT AND UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

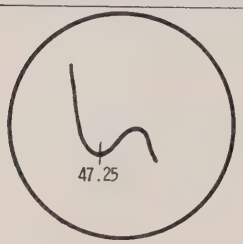


FIG. 1

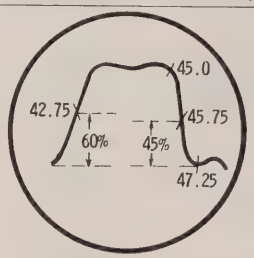


FIG. 2

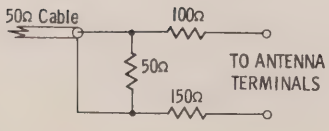


FIG. 3

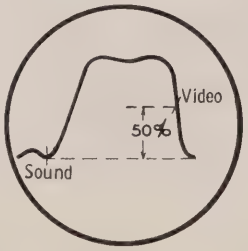
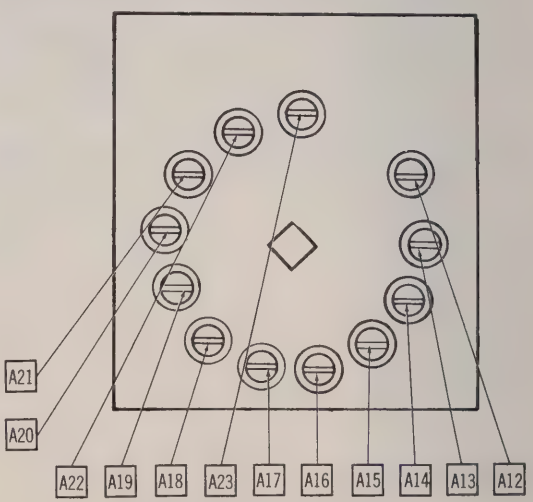
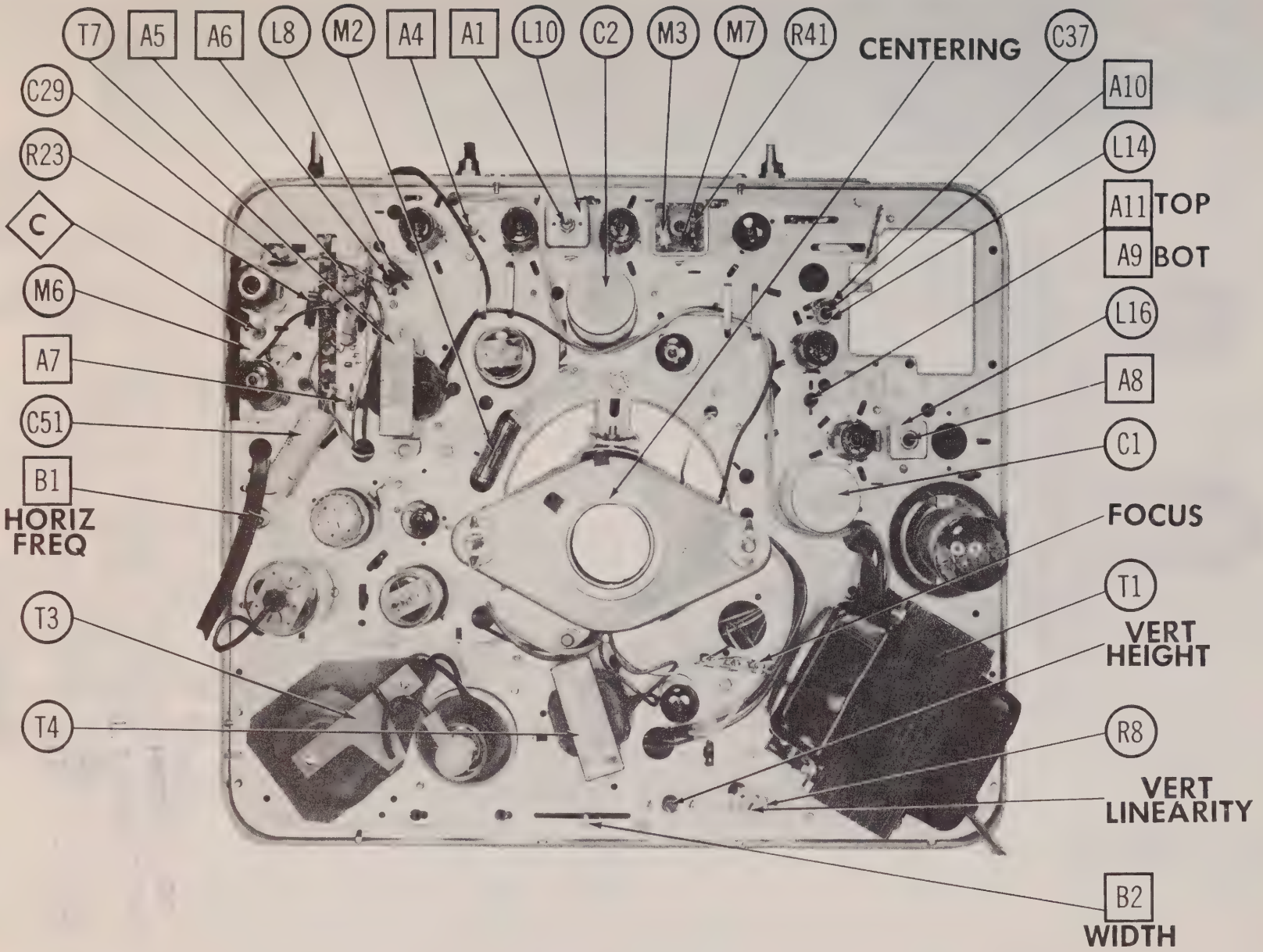


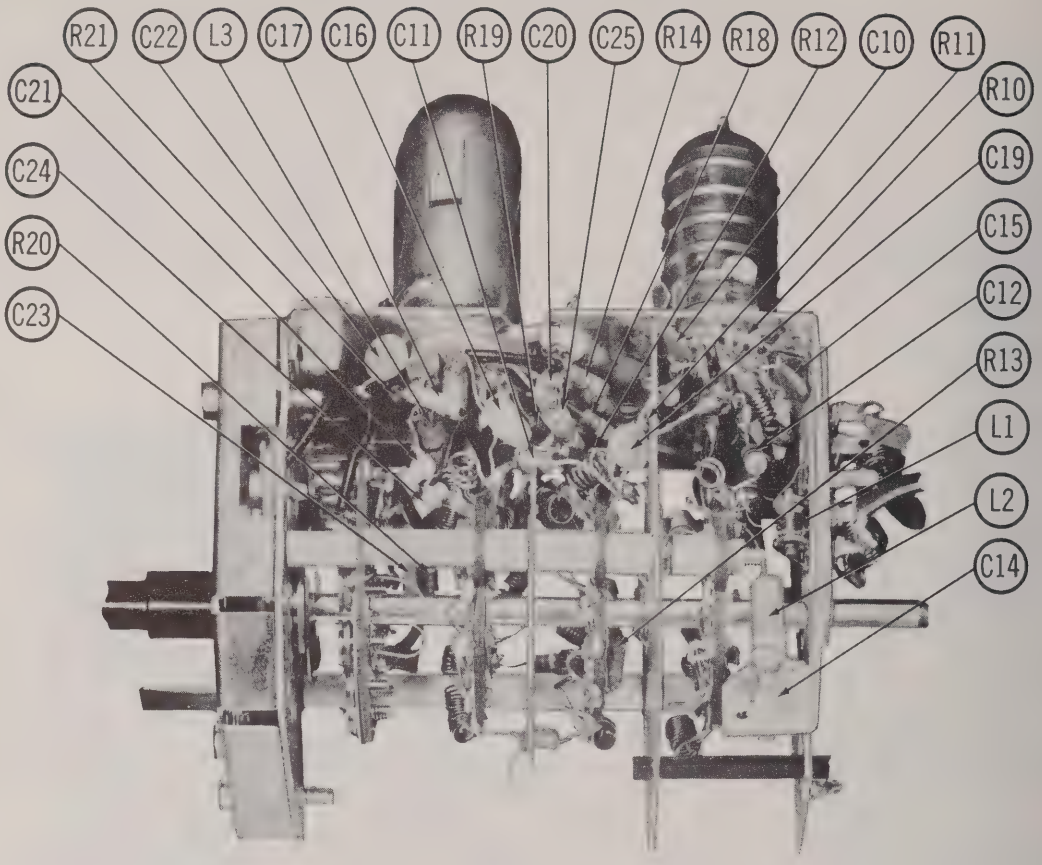
FIG. 4



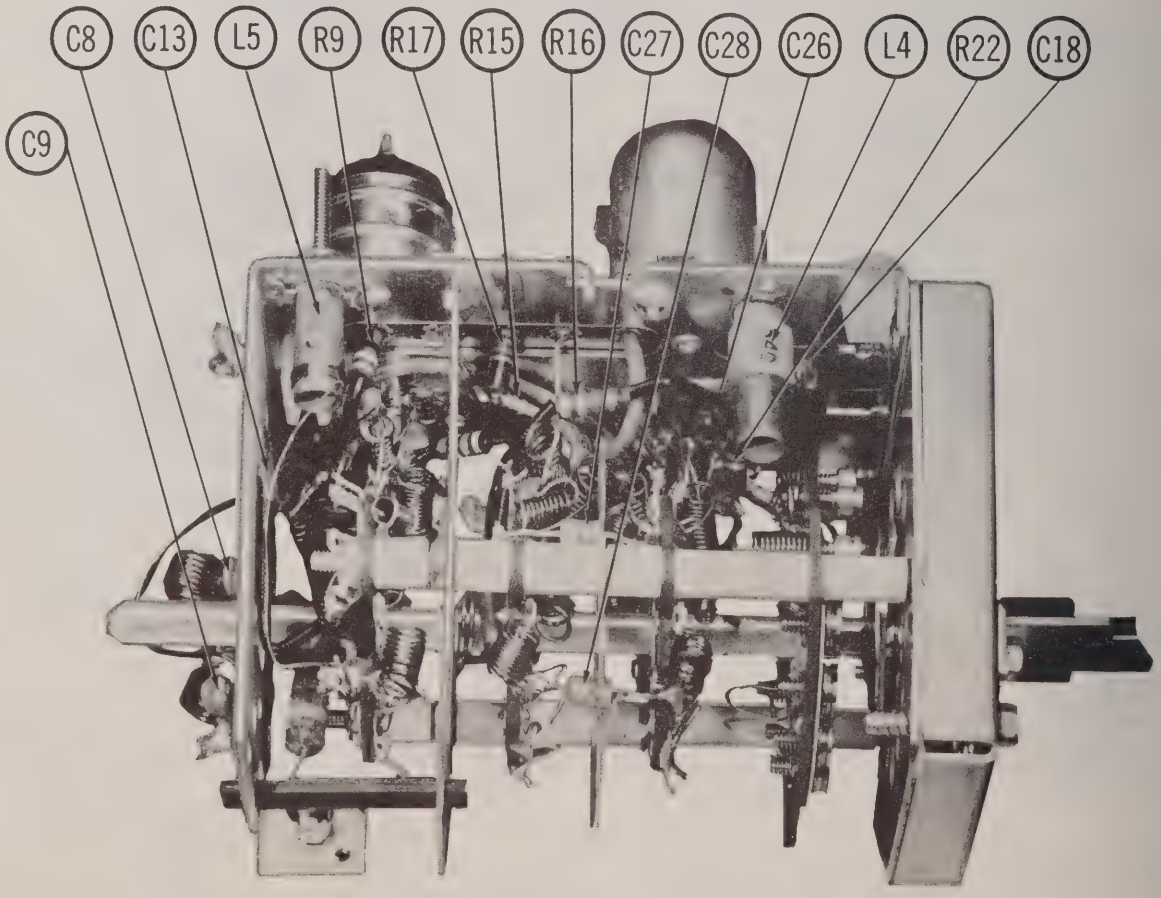


CHASSIS TOP VIEW

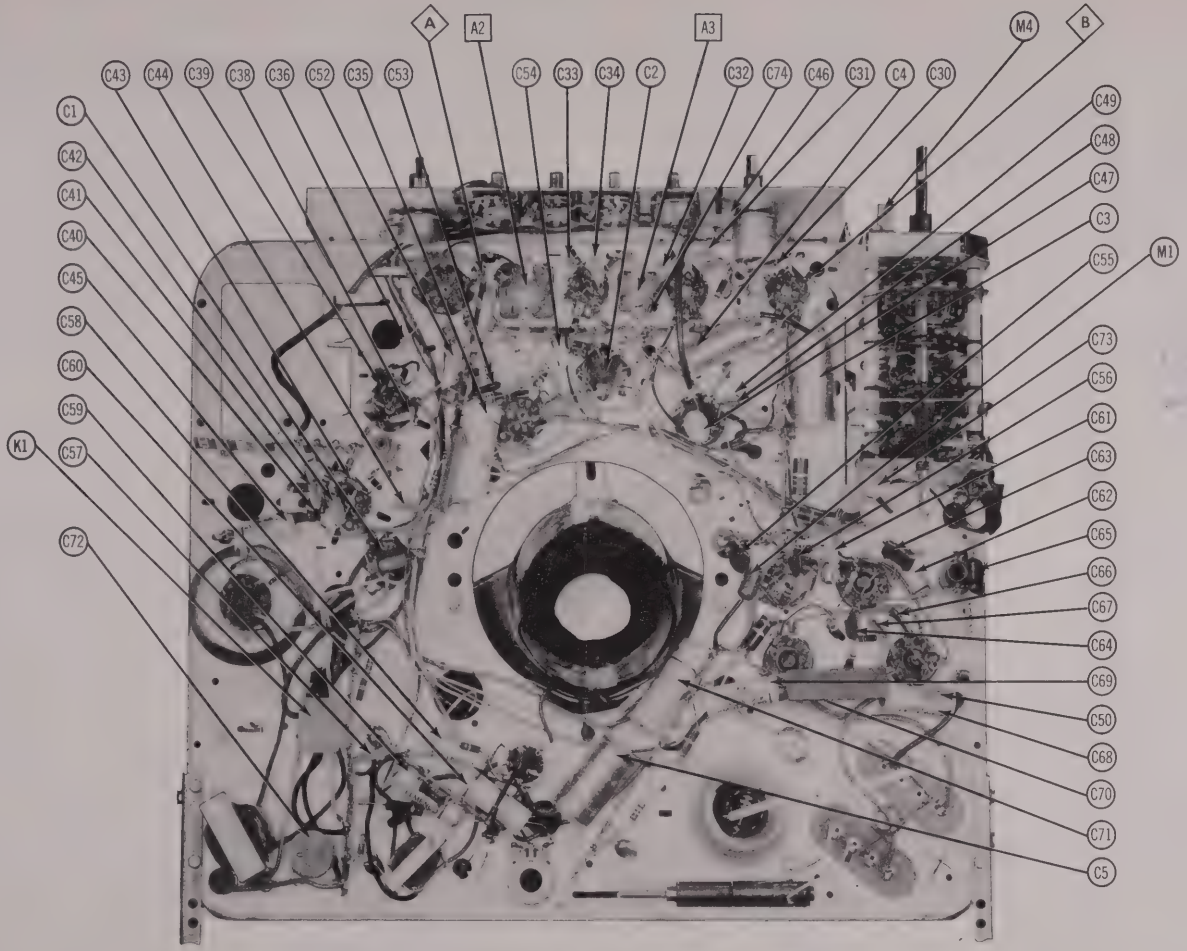
MAGNAVOX CHASSIS U21-01AA, U21-02AA,
U21-03AA, U21-04AA, V21-02AA, V21-03AA, V21-04AA



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BC8	† 2000Ω	250K	INF	0Ω	.1Ω	INF	1.1Meg	0Ω	0Ω
V2	6U8	† 40K	360K	† 100K	0Ω	.1Ω	† 5500Ω	0Ω	0Ω	10K
V3	6BZ6	55K	56Ω	.1Ω	0Ω	■ 1000Ω	■ 1000Ω	0Ω		
V4	6BZ6	50K	56Ω	.1Ω	0Ω	■ 1000Ω	■ 1000Ω	0Ω		
V5	6CB6	.1Ω	220Ω	.1Ω	0Ω	■ 1000Ω	■ 1000Ω	0Ω		
V6	12BY7	● 130Ω	4700Ω	0Ω	0Ω	0Ω	.1Ω	† 5500Ω	■ 22K	0Ω
V7	6AN8	† 1Meg	4.7Meg	0Ω	0Ω	.1Ω	380K	ǂ 1500Ω	† 23K	† 1000Ω
V8	12AU7	1Meg	1Meg	0Ω	0Ω	.1Ω	† 4000Ω	22K	3300Ω	
V9	6AU6	1.3Ω	0Ω	.1Ω	0Ω	■ 12K	■ 12K	220Ω		
V10	6DT6	3.6Ω	680Ω	.1Ω	0Ω	† 270K	■ 6800Ω	560K		
V11	6W6GT	TP	0Ω	† 450Ω	† 3600Ω	550K	NC	.1Ω	120K	
V12	6CM7	ǂ 3300Ω	NC	0Ω	.1Ω	0Ω	1.8Meg	● 1.7Meg	● 1Meg	● 1500Ω
V13	6SN7GTB	4.7Meg	† 7500Ω	1300Ω	● 140K	† 120K	1300Ω	.1Ω	0Ω	
V14	6DQ6	TP	0Ω	TP	† 12K	470K	TP	.1Ω	0Ω	TOP CAP ǂ 26Ω
V15	6AX4GT	NC	NC	INF	NC	† 35Ω	NC	0Ω	.1Ω	
V16	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ǂ 500Ω
V17	5U4GB	NC	120K	NC	22Ω	NC	20Ω	NC	120K	
V18	21ATP4	.1Ω	11K	Pin 6 ǂ 1500Ω	Pin 10 ǂ 1500Ω	Pin 11 ● 320K	Pin 12 0Ω			

† MEASURED FROM PIN 2 OF V17.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
ǂ MEASURED FROM PIN 3 OF V15.
■ MEASURED FROM 145V SOURCE.
NC NO CONNECTION
TP TIE POINT

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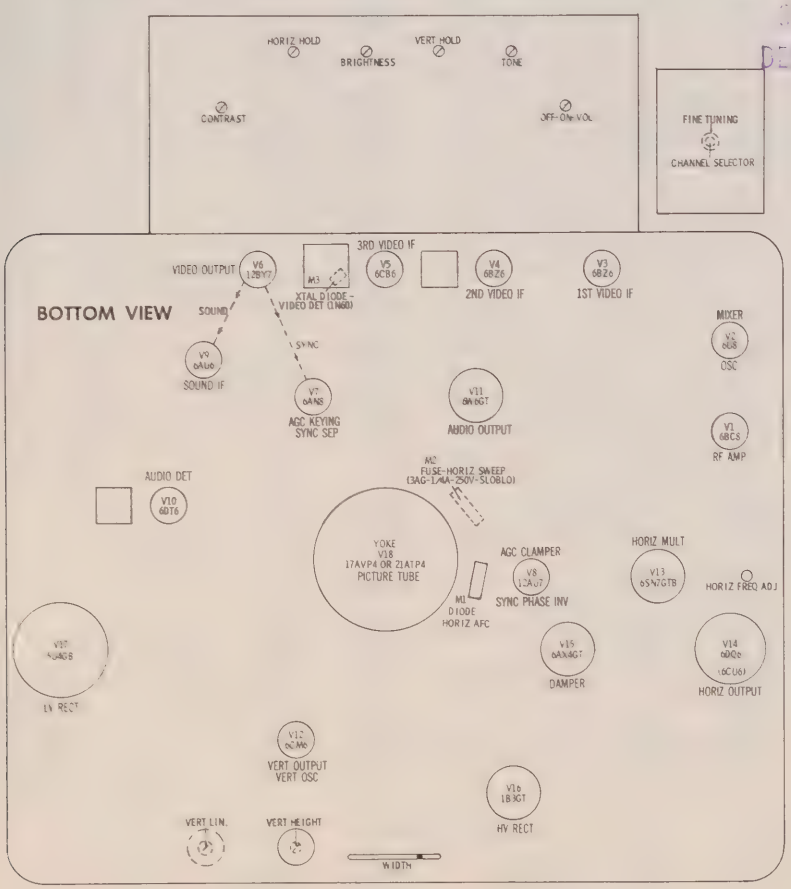
DEN



TUBE PLACEMENT CHART

SET 347 FOLDER 7

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	6BC8	
V2	Mixer-Osc.	6U8	
V3	1st Video IF Amp.	6BZ6	
V4	2nd Video IF Amp.	6BZ6	
V5	3rd Video IF Amp.	6CB6	
V6	Video Output	12BY7	
V7	AGC Keying Sync Sep.	6AN8	
V8	Sync Clamper-Sync Phase Inverter	12AU7	

Note 1: 6CU6 used as alternate

ITEM No	USE	TYPE	NOTES
V9	Sound IF Amp.	6AU6	
V10	Audio Det.	6D7 6	
V11	Audio Output	6W6GT	
V12	Vert. Osc.- Vert. Output	6CM7	
V13	Horiz. Multivibrator	6GN7GTB	
V14	Horiz. Output	6DQ6	Note 1
V15	Damper	6AX4GT	
V16	HV Rectifier	1B3GT	
V17	LV Rectifier	5U4GB	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	Magnavox PART No	CBS	GENERAL ELECTRIC	SYLVANIA PART No	
V16	21AUP4	21AUP4 ①	21AUP4 21AUP4A ①	21AUP4, A	① Aluminized ② Silver Screen "BS"
	17AVP4	17AVP4A ①	17AVP4 17AVP4A ①	17AVP4 17AVP4A ②	

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	Magnavox PART No	AEROVOX PART No	CORNELL DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No
C1A	40	350	270031-52	HR1098	CG070	FP375.5		Q-310	TVL-4631
B	10	350			BR305	TC62		MT-4530	
C	50	50							
D	70	350				FP418.88		T-T35	H2349*
C2A	30	350	270031-54	AFH4-56-93		TC60		MTD-4508	
B	100	200		5					
C	5	350							
D	30	350							
C3	20	350	270027-20	PR5450V20	BR3035	TC65	TD-20-350	FM-4520	TVA-1508
C4	3	50	270037-33	SR250V3	BR3J 50	TC702	TD-3-50	MT-0503	TVA-1501
C5	20	350	270027-20 (Note 1)	PR5450V20	BR3035	TC65	TD-20-350	FM-4520	TVA-1508

Note 1: In some versions, C5 may be a non polarized unit.
* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	Magnavox PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No
C6	15		250207-84						
C7	15		250207-84						
C8	39		250-75-39	N750-S139	TCN-39	C10Q39U	TCT-39		
C9	39		250-75-20	N750-S139	TCN-39	C10Q39U	TCT-39		
C10	470		250-75-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47
C11	.18		250218-4						
C12	10		250231-127	BPD-00001	DD-100	L10QJ	ED-10	UC-541	5GA-Q1
C13	470		250-75-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47
C14			250188-6						
C15	1500		250175-10	BPD-0015	DD-152	BYA10D15	ED-1500	UC-5215	5HK-D15
C16	15		250207-5	BPD-000015	DD-150	L15QJ5	ED-15	UC-5415	5GA-Q15
C17	6								
C18	470		250175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47
C19	100		250175-24	BPD-0001	DD-101	L10JT1	ED-100	UC-531	5GA-T1
C20	470		250175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47
C21	10		250068-136	BPD-00001	DD-100	L10QJ	ED-10	UC-541	5GA-Q1
C22	470		250218-15						
C23	.18								
C24	6		250068-143						
C25	1500		250175-10	BPD-0015	DD-152	BYA10D15	ED-1500	UC-5215	5HK-D15
C26	470		250175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47
C27	1.5		250221-115	BPD-01.5	DD-1R5		TCO-1		
C28	.56		250216-5						
C29	68	300	250235-136	NPO-S168	TCS-68	C10Q68C	TCO-68		S7CCB-Q68
C30	800		250218-14						
C31	500		250218-4	DI-680	DD-681	L10T68	ED-680	UC-5368	5GA-T68
C32	470		250218-15	DI-470	DD-471		ED-470		
C33	800		250218-14						
C34	10000		250175-3	BPD-01	DD-103	BYA10M1M	GP-10000	DC511	5HK-S1
C35	.22	400	250231-15	P468N-S22		CU34P23		GEM-4023	4TM-P23
C36	3.3		250231-158	NPO-S33.3	TCZ-3R3	C10V33C	TCO-3.3		S7CCB-V32
C37	82		250218-7	N750-S182	TCN-68	C10Q68U	TCT-68		5TCU-Q68
C38	[redacted]		BPD-004	BPD-004	DD-402	BYA10D4	GP-4000	UC-5240	5HK-D5
C39	[redacted]		250175-1	BPD-005	DD-502	BYA10D5	GP-5000	DC535	5HK-D5
C40	470		250218-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47
C41	10000		250175-2	DI-01	DD-103		GP-10000	DC511	5HK-S1
C42	10000		250218-19	DI-01	DD-103		GP-10000	DC511	5HK-S1
C43	.15								
C44	10000		250218-19	DI-01	DD-103		GP-10000	DC511	5HK-S1
C45	.047	200	250203-11	BPD-05	DD-503	CU3B247		GEM-4147	4TM-S47
C46	.047		250175-30	DI-005	DD-503	L5QD5	GP-5000	DC535	5HK-D5
C47	10000		250175-2	DI-01	DD-103		GP-10000	DC511	5HK-S1
C48	100		250218-23						
C49	.0047	500	250201-5	BPD-0047	DD-472	CU34D47	GP-4700	GEM-4347	4TM-D47
C50	1000	3000	250175-29	BPD-30-1000	DD30-102	BYB30D1		DC3021	30GA-Q1
C51	.22	200	250203-12	P588N-S22		CU33P23		GEM-3023	3TM-P22
C52	.0023	400	250231-3	BPD-0023	DD-232	CU34D23	GP-2300	GEM-4223	4TM-D22
C53	330		250218-4	DI-330	DD-331	L10T15	ED-150	UC-5315	5GA-T15
C54	.1	400	250231-13	P488N-1		DF-104	CU34P1	GEM-401	4TM-P1
C55	1000		250218-8	BPD-001	DD-102	BYA10D1M	ED-1000	DC531	5HK-D1
C56	1000		250218-8	BPD-001	DD-102	BYA10D1M	ED-1000	DC531	5HK-D1
C57	5000		250218-13			L10D5			
C58	.027	400	250231-8	BPD-03	DF-303	CU34B27		GEM-4127	4TM-S27
C59	.047	400	250231-7	BPD-05	DF-503	CU34B47		GEM-4167	4TM-S47
C60	.1	400	250231-13	P488N-1		DF-104	CU34P1	GEM-401	4TM-P1
C61	.0047	400	250231-6	BPD-0047	DD-472	CU34D47	GP-4700	GEM-4347	4TM-D47
C62	.047	300	250218-8	BPD-06	DF-503	CU3B247		GEM-3147	3TM-S47
C63	330		250232-343						
C64	1000		250218-8				ED-1000		
C65	3900	300	250236-468						
C66	470		250232-346						
C67	1000		250218-8				ED-1000		
C68	.047	400	250231-11	BPD-05	DF-503	CU34B47		GEM-4347	4TM-S47
C69	.047	400	250231-11	BPD-05	DF-503	CU34B47		GEM-4347	4TM-S47
C70	47	4000	250175-32						
C71	.1	600	250201-13	P488N-1	DF-104	CU34P1		GEM-601	4TM-P1
C72A	10000	?	250218-3	BPD-XXOR	DD502-10?	BYD40D1	GP-10000	DC511	5HK-S51
B	10000	?					GP-10000	DC511	

CAPACITORS (cont)

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	Magnavox PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No
C73	1	400	(Note 3)	P488N-1	DF-104	CU34P1		GEM-401	4TM-P1
C74	680		250218-4	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68

Note 2: Some versions may use 6.8MM F in this application.
Note 3: Some versions may use .03MFD @ 500V in this application. (Part #250175-7)

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Magnavox PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No	
R1A	1Meg	½	250135-1	B-70-9	A47-1Meg-Z	Q13-157	U53	Volume - Note 1
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch			Not Req.	SWK-12	76-1	US-26	Attach to R1A
R2A	5000	½	250138-56				U75UR	Contrast
B	Shaft						Not Req.	Attach to R2A
R3A	50K	½	250132-1	EK-31	A47-50K-S	Q11-133	TA541.	Horiz. Hold
B	Shaft			Not Req.	FS2-1/4	Not Req.	Not Req.	Attach to R3A
R4A	200K	½	250132-3	EK-46	A47-200K-S	Q11-139	U43	Brightness
B	Shaft			Not Req.	FS2-1/4	Not Req.	Not Req.	Attach to R4A
R5A	1.25Meg	½	250132-5	EK-743	A47-125Meg-S	Q11-150	TA1561.	Vertical Hold
B	Shaft			Not Req.	FS2-1/4	Not Req.	Not Req.	Attach to R5A
R6A	500K	½	250135-4	AB-65	A47-500K-Z	Q13-153	TA554	Tone
B	Shaft			AK-1	FS2-1/4	Not Req.	Not Req.	Attach to R6A
R7A	2.5Meg	½	250146-3	AB-69	A47-2.5Meg-S	Q11-230	TA2551.	Vertical Height
B	Shaft			AK-1	FS2-1/4	Not Req.	Not Req.	Attach to R7A
R8	10000	1	250180-3				FL-45	Vert. Linearity (Wire-wound)

Note 1: Part #250135-46 used in chassis V21-01AA & U21-02AA.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Magnavox PART No.	IRC PART No.	
R9	100K		250104-86	BTS-100K	
R10	470K		250104-94	BTS-470K	
R11	470K		250104-94	BTS-470K	
R12	680		250104-60	BTS-680	
R13	3300		250104-73	BTS-3300	
R14	33K		250104-80	BTS-33K	
R15	330K		250104-92	BTS-330K	
R16	3300		250104-68	BTS-3300	
R17	680		250104-60	BTS-680	
R18	820K		250104-72	BTS-820K	
R19	100K		250104-86	BTS-100K	
R20	5600		250104-74	BTS-5600	
R21	10K		250104-76	BTS-10K	
R22	150K		250104-52	BTS-150	
R23	4700	1	250105-70	BTA-4700	Note 1
R24	2.2Meg	5%	250094-254		
R25	33K		250104-80	BTS-33K	
R26	68K		250104-84	BTS-68K	
R27	330K	5%	250094-219	BTS-330K 5%	
R28	56K	5%	250094-201	BTS-56K 5%	
R29	820K	5%	250094-229	BTS-820K 5%	
R30	1000		250104-50	BTS-100	
R31	6800	5%	250094-179	BTS-6800 5%	
R32	10000		250104-62	BTS-1000	
R33	560		250104-47	BTS-56	
R34	12K	5%	250094-185	BTS-12K 5%	
R35	1000		250104-62		
R36	10000		250104-62	BTS-1000	
R37	560		250104-54	BTS-560	
R38	2200		250104-54	BTS-220	
R39	1000		250104-62	BTS-1000	
R40	2200		250104-54	BTS-220	
R41	4700				
R42	4700	5%	250094-175	BTS-4700 5%	
R43	3700		250104-91	BTS-370K	
R44	4800	5	240071-4		
R45	1000	1	250105-62	BTA-1000	
R46	33K		250105-78	BTA-33K	
R47	33K		250104-78	BTS-33K	
R48	12K		250104-76	BTS-12K	
R49	2300		250104-54	BTS-230	
R50	560K		250104-95	BTS-560	
R51	68000		250104-60	BTS-6800	
R52	680		250104-60	BTS-680	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Magnavox PART No.	IRC PART No.	
R53	270K		250104-91	BTS-370K	
R54	1.2Meg	5%	250094-233	BTS-1.2Meg 5%	
R55	1Meg	5%	250094-221	BTS-1Meg 5%	
R56	1Meg		250104-98	BTS-1Meg	
R57	3300		250104-68	BTS-3300	
R58	2700	2	250108-56	BTS-270	
R59	10K		250104-76	BTS-10K	
R60	470K		250104-94	BTS-470K	
R61	4.7Meg		250104-106	BTS-4.7Meg	
R62	1Meg		250104-98	BTS-1Meg	
R63	1Meg		250104-98	BTS-1Meg	
R64	22K		250104-78	BTS-22K	
R65	3300	5%	250094-171	BTS-3300 5%	
R66	1.2Meg		250104-99	BTS-1.2Meg	
R67	220		250104-78	BTS-22K	
R68	[redacted]				
R69	[redacted]				
R70	220K	2	250130-2		Note 2
R71	1Meg	1	250105-66	BTA-1Meg	
R72	11K	5%	250094-104	BTS-11K 5%	
R73	100		250104-42	BTS-1000	
R74	3000	5%	250094-168		
R75	3000	5%	250094-168		
R76	270K		250104-91	BTS-370K	
R77	270K		250104-91	BTS-370K	
R78	100K		250104-86	BTS-100K	
R79	100K		250104-86		
R80	470K		250104-94		
R81	4.7Meg		250104-106	BTS-4.7Meg	
R82	6800	5%	250094-179	BTS-6800 5%	
R83	1500	5%	250094-163	BTS-1500 5%	
R84	100K	5%	250094-307		
R85	180K	5%		BTS-180K 5%	Note 3
R86	13K		250104-76		
R87	470K		250104-94		
R88	15K	5	240071-5	1 3/4A-15K	
R89	1500	1	250105-64	BTA-1500	
R90	180	2	250105-41		
R91	6800	2	250104-72	BTS-6800	
R92	3.9	1	250107-3	BW1-3.9	
R93	1500	1		BTA-1500	Note 4
R94	6800		250104-60	BTS-680	
R95	180K		250130-1	BTS-180K	

Note 1: Not used in some versions.
Note 2: Negative temp. coeff. resistor (approximately 800K cold).
Note 3: A 180K 5% resistor is used in some versions. (Part #250094-311)
Note 4: A 2200Ω 2W resistor is used in some versions. (Part #250106-86)

TRANSFORMER (POWER)

ITEM No	RATING		REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Magnavox PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC	575VCT	5V	6.3V	300077-1	P5732 ①	P5077 ①	P-8335 ② ③	26R335 ① ② ③	R-52BC ① ② ③
	① 1.56A	② 210A	③ 3A	④ 9.5A						

① Fabricate mounting.
② Use original mounting bracket.
③ Parallel and phase 5.3V filament windings.
④ Parallel and phase 6.3V, 5A windings.
⑤ Tape 5.3V, 1.2A winding.
⑥ Tape low high voltage winding; tape 5V, 3A winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA								
		Magnavox PART No	Halldorson PART No	Merit PART No	BCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T2	Vert. Osc. Trans.	330252-1							
T3	Horiz. Output Trans.	330523-1							
T4	Vert. Output Trans.	330253-1	Z1807 ①	A-2254 ①		V31-1 ①	A-8285*	FLY-72*	A-109X ② ③
T5A	Yoke(90°) Horiz(21MH)	250171-1	DF607 ①	MDF-92 ①	23DU ①	Y90P19/43 ①	A-8343 ②	28B54 ②	Y-41-1 ②
B	Vert(44MH)	250152-2					DY-18A ③	Y-19 ③	
T6	Width Coil (4-21MH)	330553-1	RF600 ② ③	MWC-10 ② ③	21HR1 ② ③	20LR3A ②	WC-12 ①	WC-24 ① ② ③	WC-11 ① ②

① Cut and tape blanking lead.
② Drill new mounting hole(s).
③ Connect as auto trans.
④ Take rear cover.
⑤ Use original yoke damping network.
⑥ Use terms 1 and 3.
⑦ Use black and white terms.
⑧ Use terms 2 and 3.
⑨ Use orig. mounting bracket.
⑩ Use coil (L2).
⑪ Use red and blue terms.
* This part may be superseded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	BCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
8					8	8	
9					9	9	
6					6	6	
3					3	3	
4					4	4	
5					5	5	
2					2	2	
1					1	1	
Connect Width Coil Across	1 & 3				1 & 3	1 & 3	
Special Notes						⑪	

⑫ If insufficient width, add capacity (approx. 50-100MMF @ 4KV) across horiz. yoke.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Magnavox PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T7	5.5K	3-4Ω	330068-3	Z1007	A-3018	A-3949	26B50	S-53X	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA	NOTES
		Magnavox PART No	
L1	Antenna Input Trap	250241-3	
L2	RF Choke	250201-6	
L3	RF Choke	250201-9	

ITEM No.	USE	REPLACEMENT DATA	NOTES
		Magnavox PART No	
L4	IF Output Coil	250240-4	
L5	IF Input Coil	250249-1	
L6	RF Choke	250201-1	
L7	RF Choke	250201-4	

ITEM No.	USE	REPLACEMENT DATA				NOTES
		Magnavox PART No	MEISSNER PART No	MERIT PART No	MILLER PART No	
L8	1st Video IF	250240-1	17-4622	TV-132	6319	
L9	2nd Video IF	250238-1	17-6003	TV-128	6323	Includes Trap
L10	3rd Video IF	250237-1	19-2560		6320	900 Microhenries
L11	Shunt Peaking Coil	250232-10	19-2560		6320	225 Microhenries; Wound on 33K resistor.
L12	Series Peaking Coil	250232-15	19-2350*	TV-185*	6181*	
L13	Shunt Peaking Coil	250232-16	19-2300	TV-185	6130	275 Microhenries
L14	1st Sound IF	250257-1				
L15	2nd Sound IF	250250-1			1481	
L16	Quadrature Coil	250251-1				
L17	Ant. Trap Coil					
L18	Ant. Trap Coil					

* Parallel with 39K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Magnavox PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	BCA TYPE No.	Ram PART No.	Thordarson PART No.
L19	62Ω		250179-1						28-7

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE @ CURRENT 1000 ^M/A	Magnavox PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L20	.210A	34.8Ω	4.48H	330051-3	C5040 ①	C-2976 ①	C-2336 ①	36C41 ①	C-32X ①

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	Magnavox PART No	REPLACEMENT DATA	
K1	Vertical Integrator	3000MMF, 5000MMF, 5000MMF, 22K, 820Ω, 820Ω	250188-1	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-110 PC-100 1157M1 1436-05 V-1

MAGNAVOX CHASSIS U21-01AA, U21-02AA, U21-03AA, U21-04AA, V21-02AA, V21-03AA, V21-04AA

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM DIODE

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Magnavox PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1		530045-1		1T1 ①				Horiz. Phase Det. (Pigtail) ① 2 required.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Magnavox PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG S/B	1/4A 250V	180157-30		312.250 (3AG-1/4A-S/B)	357001	MDL 1/4	4405

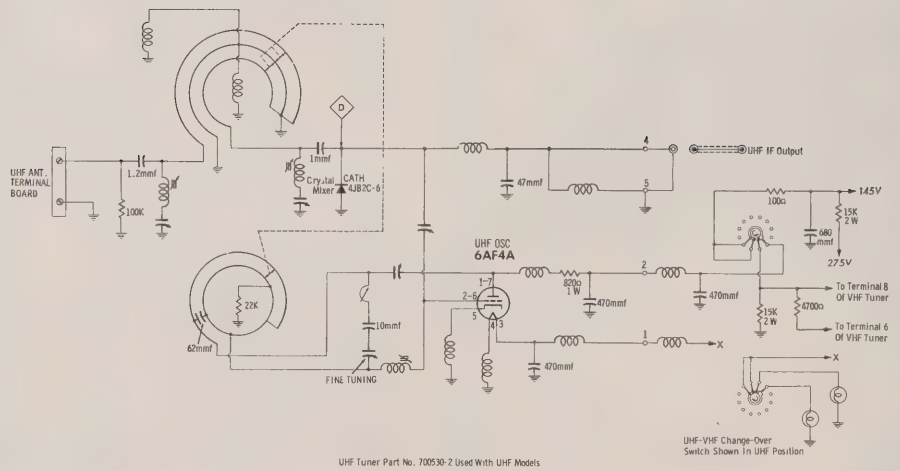
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		Magnavox PART No.	SYLVANIA PART No.	
M3	1N60*	Note 1	1N60	Video Detector (Pigtail)

* 1N64 may be used in some versions.
Note 1: Part of detector assembly M7 part #360638-1.

MISCELLANEOUS

ITEM No.	PART NAME	Magnavox PART No.	NOTES
M4	Pilot Lamp		
M5	Tuner	700541-3	VHF
M6	Tuner	700530-2	UHF, Used in U21 chassis.
M7	Detector Ass'y.	360638-1	Includes crystal (M3), 4th Video IF, 470Ω resistor, 10MMF Cap., and Series Peaking Coil.
M8	Centering Device		
M9	Ion Trap	360492-5	



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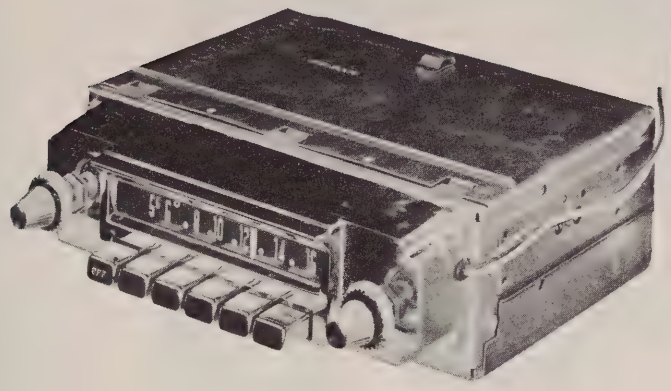
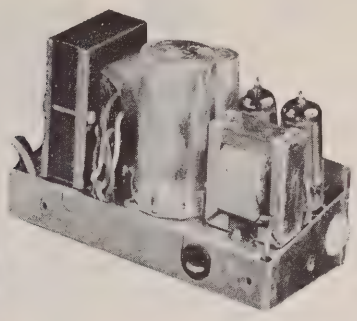
ALTERNATE UHF TUNER SCHEMATIC

MOPAR MODELS
841, 842, 843





TRADE NAME	Mopar Models 841 (For P28, P29 Plymouth), 842, 842HR (For D62, D63 Dodge), 843 (For S23, S24 Desoto)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated Custom Built AM Automobile Receiver
TUBES (Eight)	Types 12BA6 RF Amplifier, 12BE6 Converter, 12AU6 IF Amplifier, 12AV6 Det.-AVC-AF Amp.., 12BF6 Phase Inverter, (2) 12AB5 Output , 12X4 Rectifier
POWER SUPPLY	12 Volt Storage Battery — RATING 3.8 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540KC-1610KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting. Tone control to mid-range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD •	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	262KC (400%Mod)	High freq. end of dial	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy antenna to antenna receptacle	1615KC	"	"	A5, A6, A7	"
	The following steps are unnecessary unless tuner has been tampered with or in case of component replacement.						
3.	Fig. 1	Thru dummy antenna to antenna recepacle	1615KC	High freq. end of dial	Across voice coil	A5, A6, A7	Back tuning cores (A8, A9, A10) approximately 1" out of coil forms. Adjust for maximum output.
4.	Fig. 1	"	1000KC	Back tuning core carriage 25/32" from high freq. end stop.	"	A8, A9, A10	Adjust for maximum output. (Use Motorola alignment tool #66A76278).

With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum volume.

POINTER CALIBRATION

Tune receiver to a 1000KC signal and adjust pointer adjusting cam so that pointer coincides with 1000KC on dial.

PUSHBUTTON ADJUSTMENT

1. Turn on receiver and allow a fifteen minute warm-up period. Fully extend antenna.
2. Pull pushbutton to the left and out.
3. Accurately tune in a station manually.
4. Lock pushbutton by pressing in firmly.
5. Repeat above procedure for remaining pushbuttons.

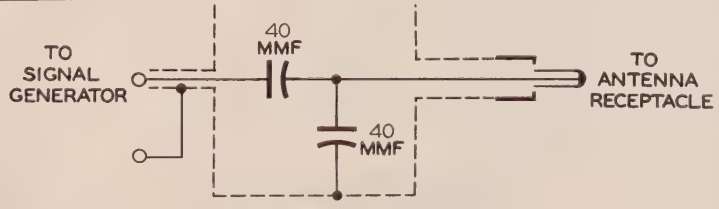


FIG. 1

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Converter	12BE6	
V3	IF Amplifier	12AU6	
V4	Det.-AVC-AF Amplifier	12AV6	

ITEM No.	USE	TYPE	NOTES
V5	Phase Inverter	12BF6	
V6	Output	12AB5	
V7	Output	12AB5	
V8	Rectifier	12X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■20	350	25A532094	AFH3-107	CO800	FP329.5	TMT-92	T-470	TVL-3635
B	▲20	350							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

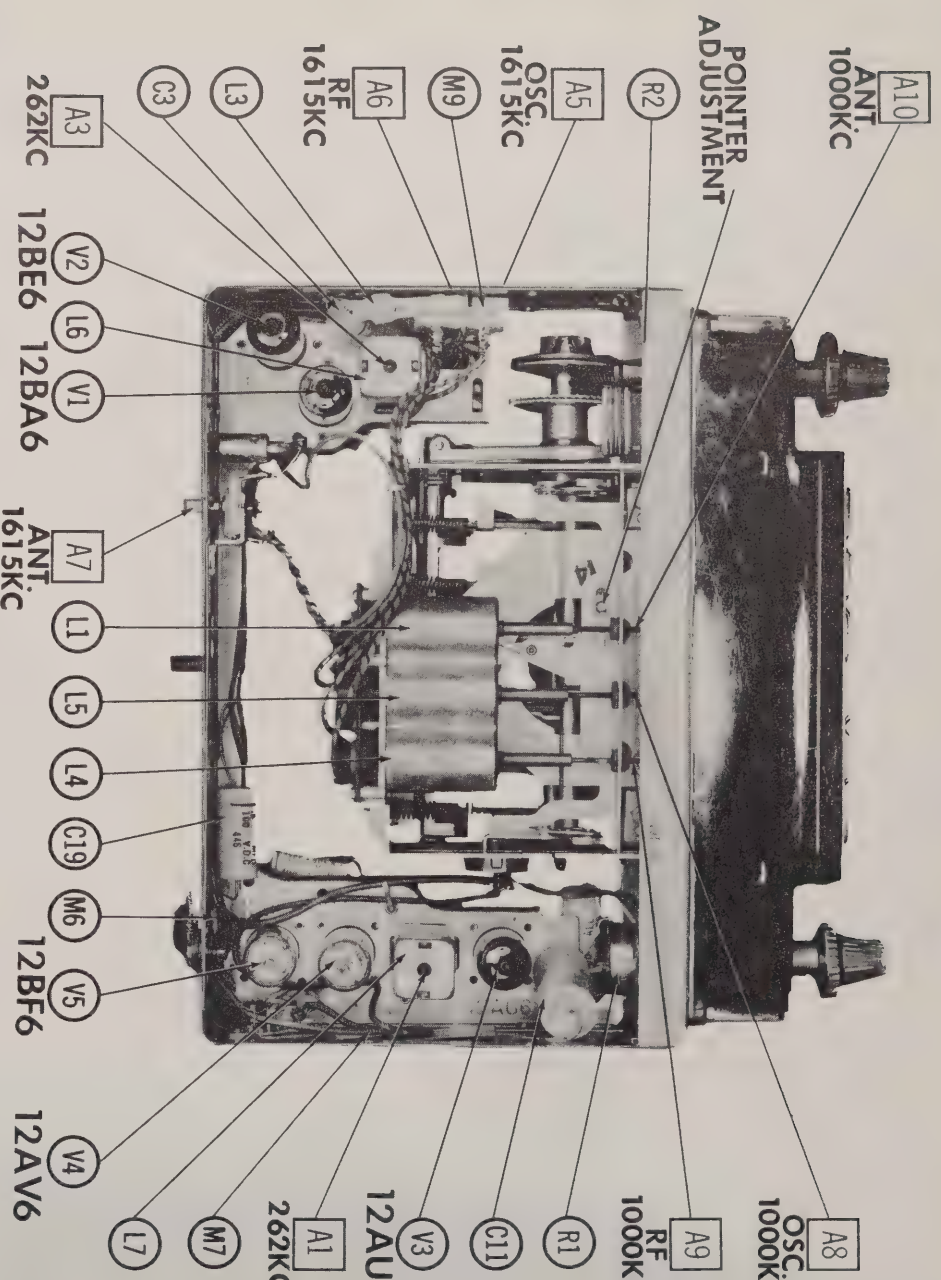
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	27		21R120567	N750-SI 25	TCN-27	TN08	TC7-27		5TCU-Q25	
C3	.05	200	8R121005	BPD-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C4	.05	400	8R121567	BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C5	56		21R120152							
C6	100		21R115042							
C7	.006	400	8R121001	SI 6000		CUB6D6	GP-6000	GEM-626	6TM-D6	
C8	330		21R410118	BPD-00033	DD-331	G056	ED-330	UC-5333	5GA-T33	
C9	.01	400	8R121002	BPD-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C10	.1	200	8R121573	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C11	.25	100	8K122045	P288N-25		CUB2P25		GEM-2025	2TM-P25	
C12	.006	400	8R121001	SI 6000		CUB6D6	GP-6000	GEM-626	6TM-D6	
C13	.01	400	8R121002	BPD-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C14	.01	400	8R121002	BPD-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C15	.003	600	8R121569	BPD-003	D6-302	CUB6D3	GP-3000	GEM-623	6TM-D3	
C16	.04	1000	8A121549	P1088N-04		CUB16S4		GEM-1014	MB-S4	
C17	.5	100	8K122076	VHC36		ST2P5		RF480	68P20	
C18	.5	100	8K122076	VHC36		ST2P5		RF480	68P20	
C19	.5	100	8K122076	VHC36		ST2P5		RF480	68P20	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	4Meg *	½	18K536710		RTV-608C			Tone - Note 1
B	1.5Meg	½						Volume
R2	25Ω	2	18B532919					Rear Seat Speaker(W.W.) Note 2

* Element open in center - 2Meg each half.
Note 1. Part #18K536709 used in Model 843. Part #18K536152 (R1A 500K) used in Model 841.
Note 2. Part #18K536153 used in Model 841.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R3	470K		6R6032	BTS-470K	
R4	10K	1	6R6430	BTA-10K	
R5	330K		6R6014	BTS-330K	
R6	47K		6R6056	BTS-47K	
R7	12K	4	17K737688	1 3/4A-10-12K	Note 1
R8	560Ω		6R6291	BTS-560	
R9	47K		6R6056	BTS-47K	
R10	1Meg		6R6004	BTS-1Meg	
R11	15Meg		6R488264	BTS-15Meg	
R12	180Ω		6R5660	BTS-180	
R13	220K		6R6015	BTS-220K	
R14	220K		6R6407	BTS-220K	
R15	15Meg		6R488264	BTS-15Meg	
R16	220K		6R6407	BTS-220K	
R17	470K		6R6377	BTS-470K	
R18	470K		6R6377	BTS-470K	
R19	330Ω	1	6R6254	BTA-330	
R20	2200Ω		6R6069	BTS-2200	
R21	2200Ω	1	6A533220	BTA-2200	

Note 1. Model 841 uses 12K, 1W in this application (Part #6K533221).

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12.6VCT @2.1A	540VCT @.069A			25C535794			P-6493	22R52 ①	

① Fabricate mounting.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6400Ω	3-4Ω	25B533038	Z1004 ①	A-2900①	A-3850①	22S47 ①	S-51X ①	① Fabricate mounting.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	6" x 9"	PM	3-4Ω	50K533875 ①	69A3	① Used in Models 842 and 843
	6" x 9"	PM	3-4Ω	50C533214 ②	69A3	② Alternate speaker for Models 842 and 843
	7"	PM	3-4Ω	50C533876 ③	7A31	③ Used in Model 841
	7"	PM	3-4Ω	50B533217 ④		④ Alternate speaker for Model 841

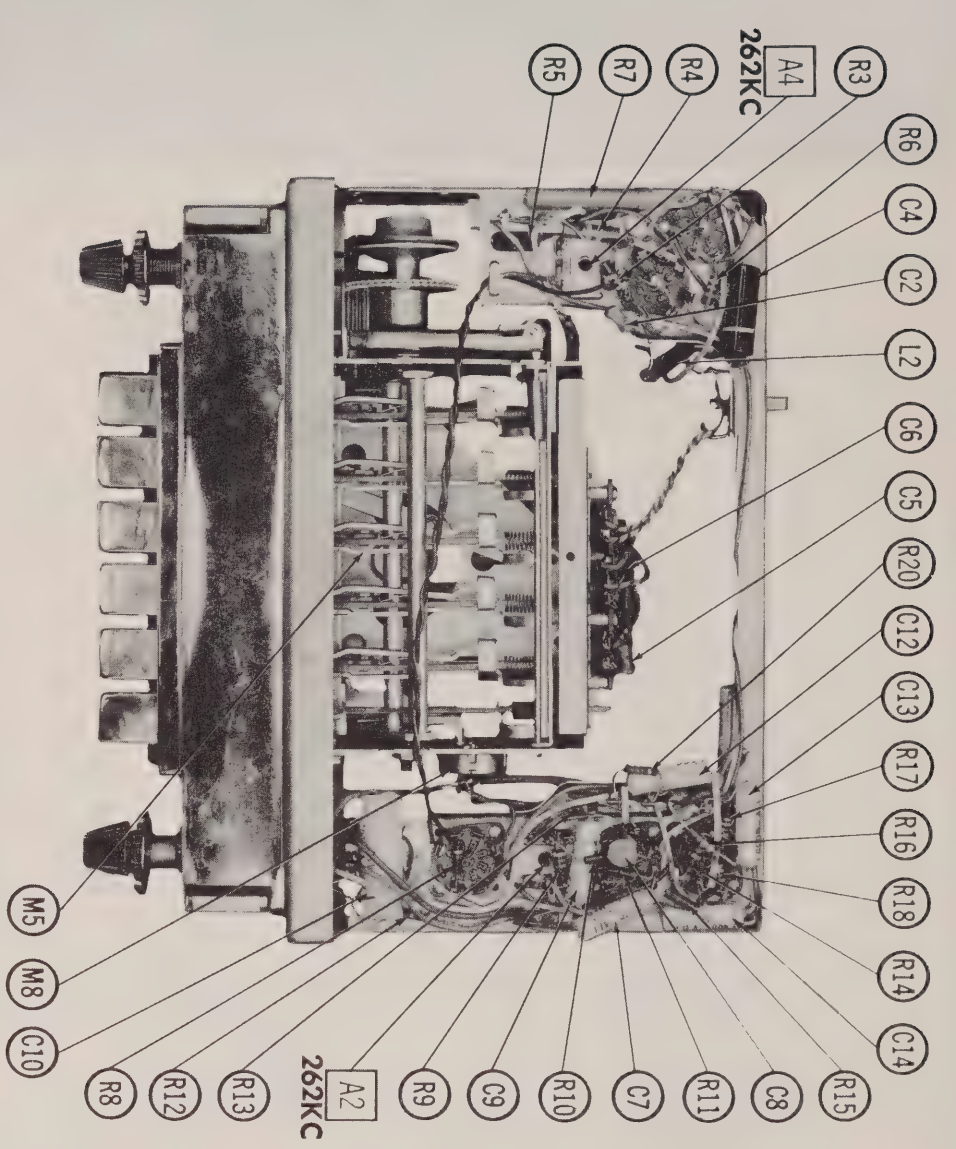
COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	1B534760				Core part #76K534779
L2	Ant. Loading Coil	24A532148	19-6033			31 Microhenries
L3	IF Trap	24B532979	19-4201		6154	207 Microhenries
L4	RF Coil	1B534760				Core part #76K534779
L5	Osc. Coil	1B535476				Core part #76K534779
L6	Input IF	24B580193	16-6752	BC-350	12-H1	
L7	Output IF	24K591267	16-6754	BC-354	12-H6	
L8	Vib. Hash Choke	24A534494				

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	12.6V	115∿	48B522000	6301	G859	6301	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

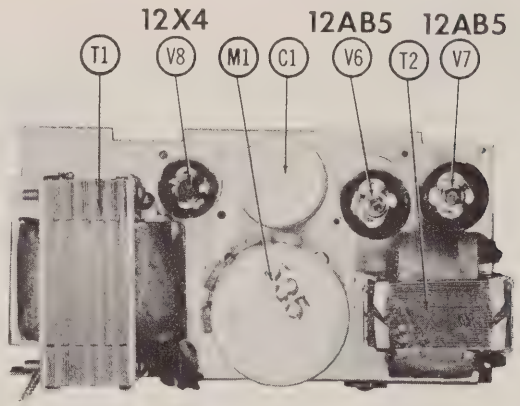
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	9A	65K16248	9K535719	307009. (SFE 9A)	155009.	SFE9	HRH

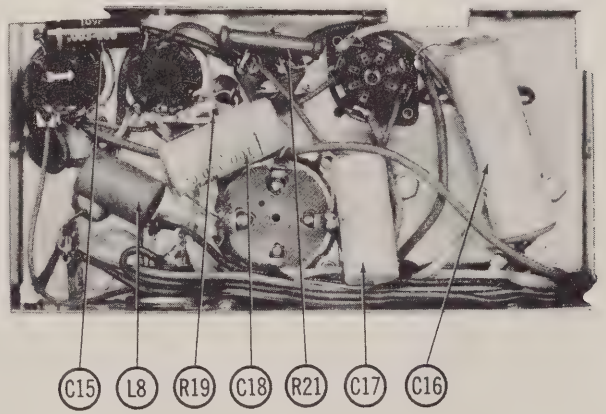
MISCELLANEOUS

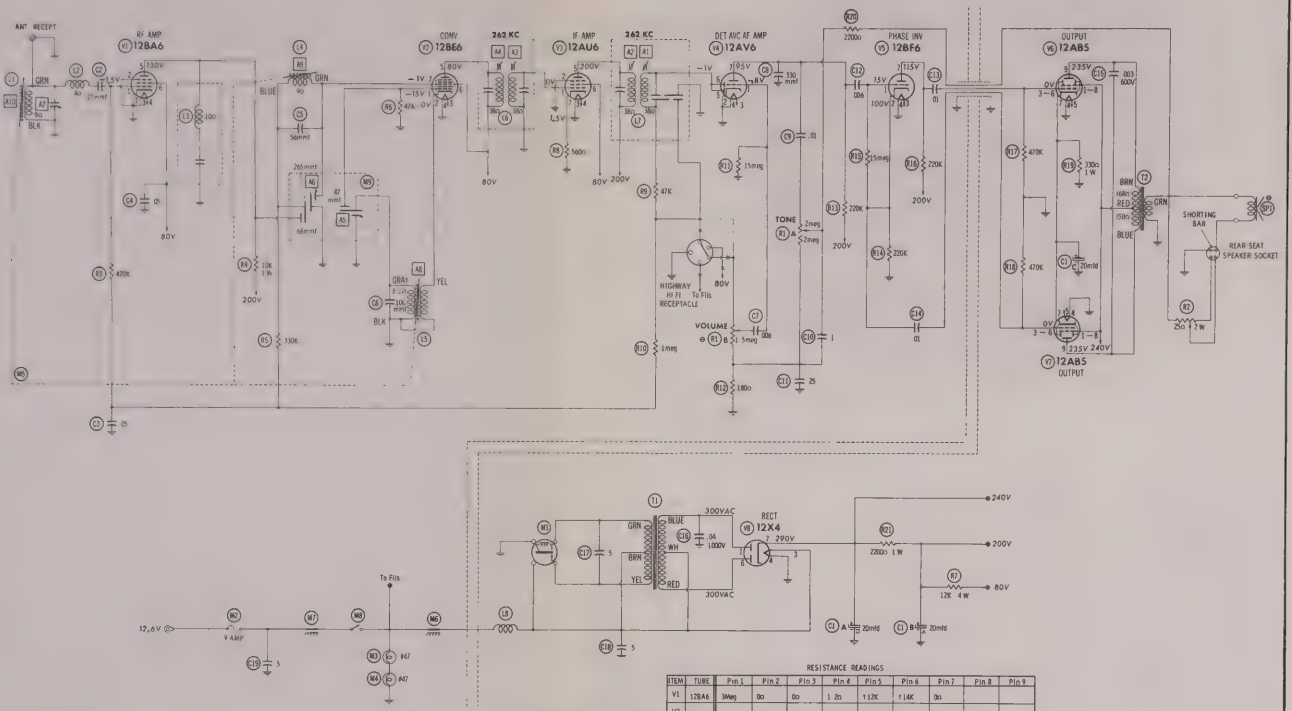
ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Dial Light	65X11854	#47
M4	Dial Light	65X11854	#47
M5	Tuner	77K535792	Model AT-167, Permeability complete. Includes L1, L4 and L5. Used in Models 842HR, 842
	Tuner	77K535575	Model AT-172, Permeability complete. Includes L1, L4, and L5. Used in Model 843
	Tuner	77K536146	Model AT-173, Permeability complete. Includes L1, L4, and L5. Used in Model 841.
M6	Spark Plate	64K530177	12.6V power input lead
M7	Spark Plate	64K530177	Filament
M8	Switch	40B534023	On-off (Power)
M9	Trimmer Cap.	20K533409	Dual: Osc. (A5), Nominal 160MMF and RF (A6) Nominal 120MMF, Unit also includes 68MMF, 265MMF and 47MMF. fixed capacities
A7	Trimmer Cap.	20B532899	Ant. (20-150MMF)
	Knob	36B533005	Tone & speaker, Model 841
	Knob	36B532949	Tone & speaker, Models 842HR, 842
	Knob	36B535692	Tone & speaker, Model 843
	Knob	1V533308	Volume & tuning, Model 841
	Knob	1V533109	Volume & tuning, Models 842HR, 842
	Knob	1V532877	Volume & tuning, Model 843
	Pushbutton	38B533284	5 used, Model 841
	Pushbutton	1K533598	5 Used, Models 842HR, 842
	Pushbutton	1B533596	5 Used, Model 843
	Pushbutton	38B533285	"Off", Model 841
	Pushbutton	1K533599	"Off", Models 842HR, 842
	Pushbutton	1K533597	"Off", Model 843
	Dial Scale	34K533019	Model 841
	Dial Scale	34K535144	Models 842HR, 842
	Dial Scale	34K535142	Model 843
	Dial Crystal	61K532894	Model 841
	Dial Crystal	61K532893	Models 842HR, 842

POWER CHASSIS - TOP VIEW



POWER CHASSIS - BOTTOM VIEW.





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BA6	1Meg	0Ω	0Ω	1.2Ω	↑12K	↑14K	0Ω		
V2	12BE6	47K	.9Ω	1.2Ω	0Ω	↑14K	↑14K	2.8Meg		
V3	12AU6	3Ω	0Ω	0Ω	1.2Ω	↑220Ω	↑14K	560Ω		
V4	12AV6	1.5Meg	0Ω	1.2Ω	0Ω	1.5Meg	1.5Meg	↑220K		
V5	12BF6	1.5Meg	220K	1.2Ω	0Ω	0Ω	0Ω	↑220K		
V6	12AB5	↑0Ω	NC	470K	0Ω	1.2Ω	470K	330Ω	↑0Ω	↑168Ω
V7	12AB5	↑0Ω	NC	470K	0Ω	1.2Ω	470K	330Ω	↑0Ω	↑150Ω
V8	12X4	260Ω	NC	1.2Ω	0Ω	▬	280Ω	10K		

↑ MEASURED FROM PIN 7 OF V8.
NC NO CONNECTION.
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Middle conentions are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.5 volts for voltage readings.
5. Minimum tolerance on components values makes possible a variation of 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

◎ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

COLORADO

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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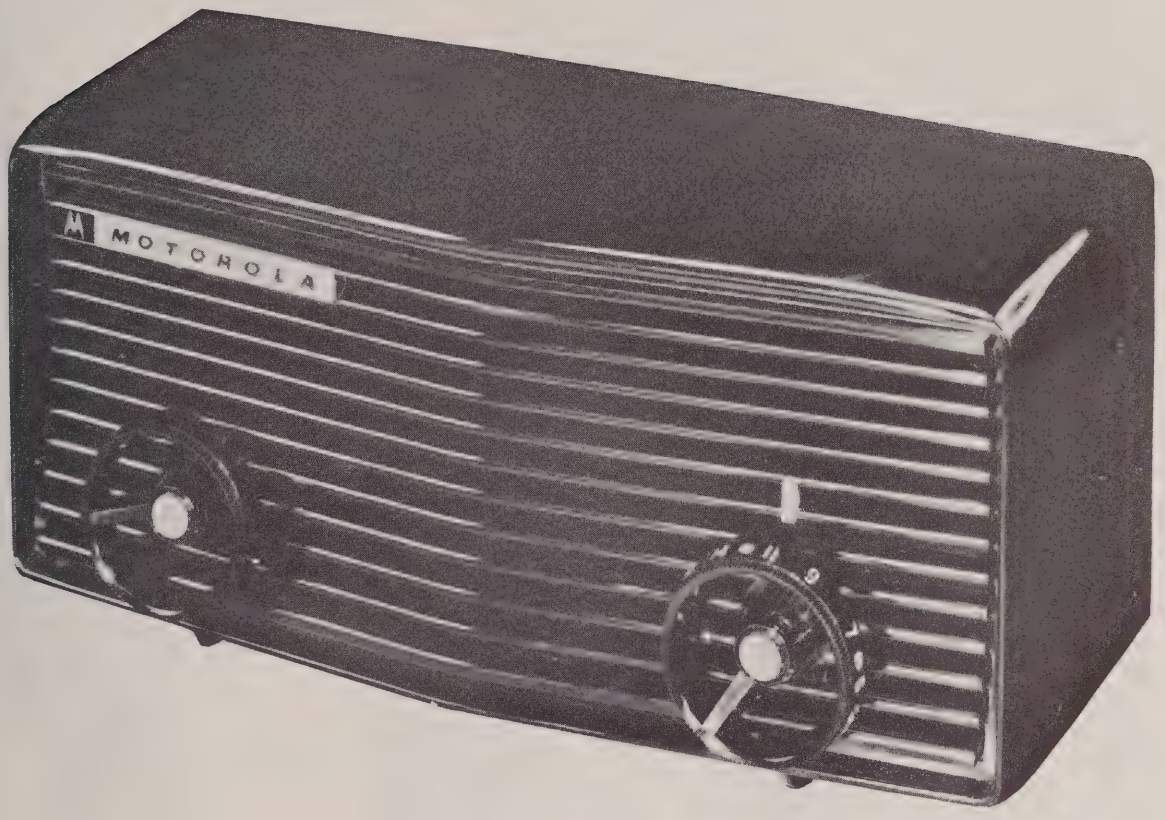
MOTOROLA MODELS 57R1, 57R2, 57R3, 57R4 (Ch. HS-522)



MOTOROLA MODELS 57R1, 57R2, 57R3, 57R4 (Ch. HS-522)

TRADE NAME	Motorola Models 57R1, 57R2, 57R3, 57R4 (Ch. HS-522)
MANUFACTURER	Motorola, Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	AC-DC Operated AM Receiver
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400%Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"

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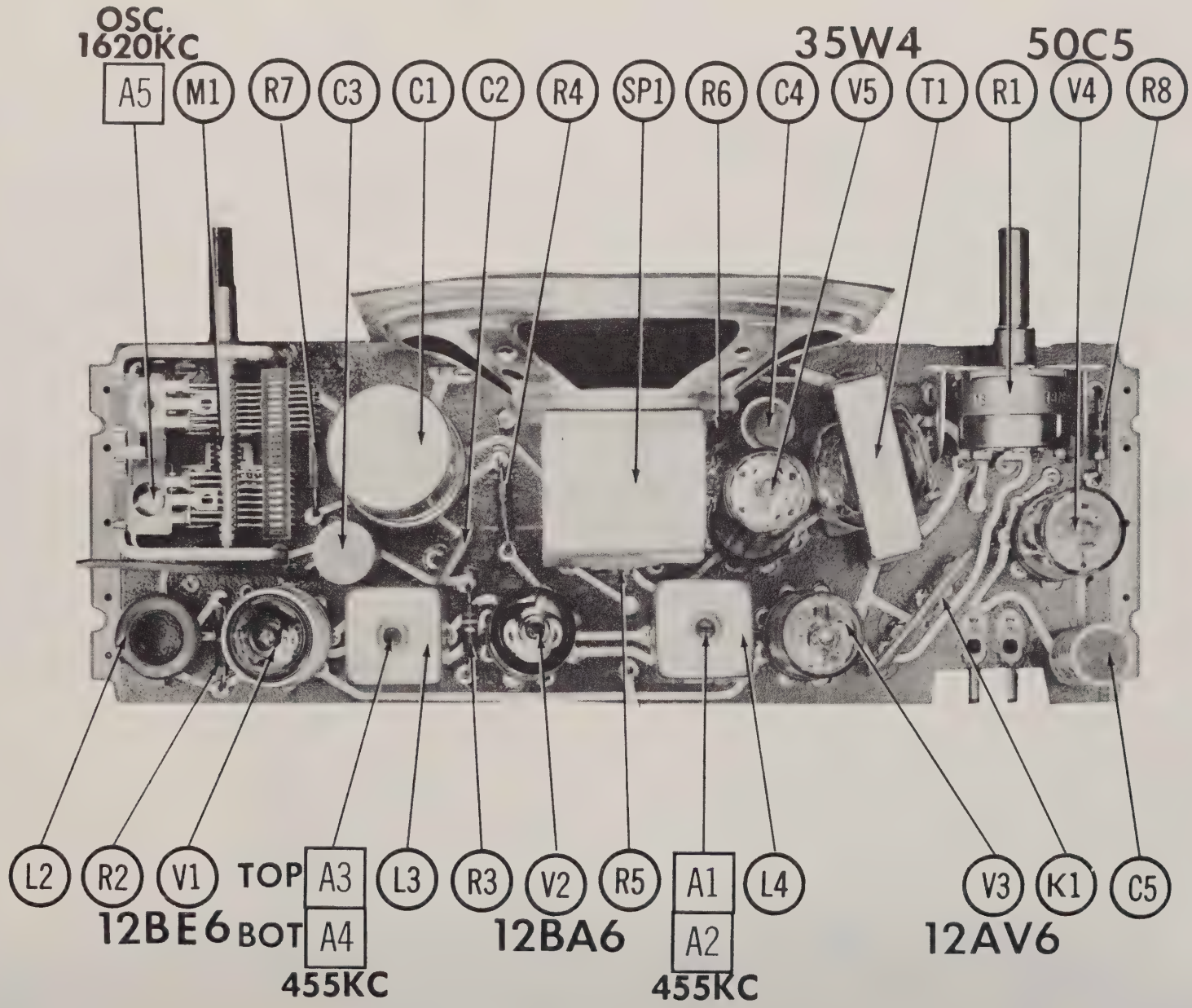


CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amplifier	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■50	150	23B632015	AFH2-15	BO150	FP213	TMD-12	D-065	TVL-2432
B	▲30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	10000		21R120853	BPD-01	DD-103	K082	GP-10000	DC511	5HK-S1	
C3	.05	200	8B120842	BPD-05	DF-503	CUB2S5		ACE615	2SE-S47	
C4	.03	400	8K122983	BPD-03	DF-303	CUB6S3			4SE-S33	
C5	.05	400	8K121268	BPD-05	DF-503	CUB4S5		ACE615	4SE-S47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1Meg	½	18K635823					Volume and switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R2	22K		6R6028	BTS-22K	
R3	27K		6R6434	BTS-27K	
R4	100Ω		6R6018	BTS-100	
R5	3.3Meg		6R2118	BTS-3.3Meg	
R6	150Ω		6R3992	BTS-150	
R7	1000Ω	1	6B119404	BTA-1000	
R8	27Ω		6R5683	BTS-27	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2400Ω	3-4Ω	25B632025		A-3025 ①			S-12X ①	① Use original channel mtg.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	50C635923	4A07	

COILS (RF-IF)

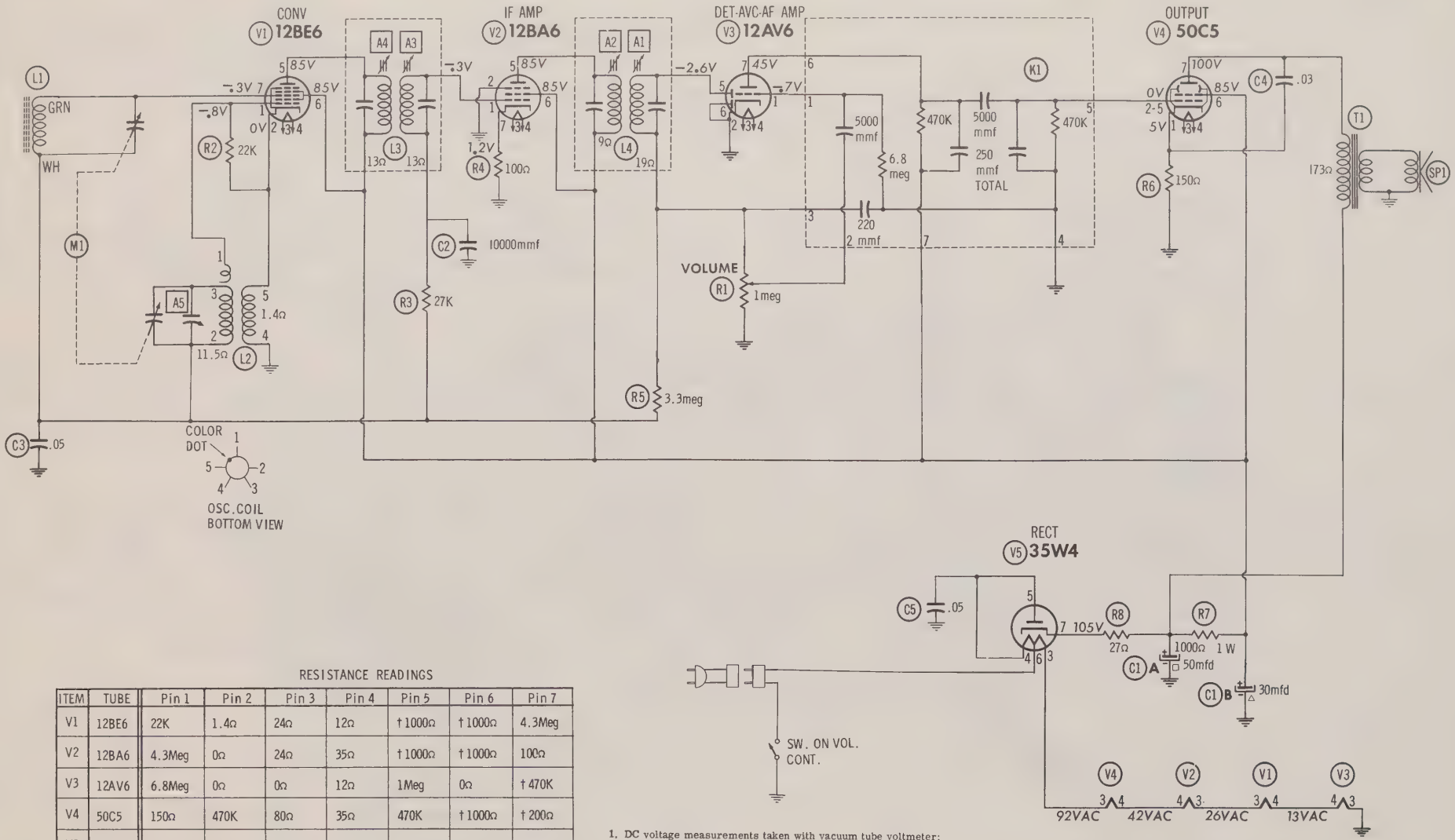
ITEM No.	USE	REPLACEMENT DATA MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Stick	1V636082				Includes cabinet back
L2	Osc. Coil	24B631990				
L3	Input IF	24K636016				
L4	Output IF	24K636017				

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION		MOTOROLA PART No.	REPLACEMENT DATA	
K1	Detector-Audio Network	5000MMF	6.8Meg	51B635833	Aerovox	PA512
		5000MMF	470K		Centralab	PCT-158
		220MMF	470K		Sprague	DT-5
		250MMF				

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M1	Tuning Cap.	19B635821	
	Cabinet	1V636096	Black, Model 57R1
	Cabinet	1V636097	White, Model 57R2
	Cabinet	1V636098	Turquoise, Model 57R3
	Cabinet	1V636099	Pink, Model 57R4
	Knob	36D635855	Tuning, White, Model 57R1
	Knob	36K635856	On-off volume, White, Model 57R1
	Knob	36K635857	Tuning, Black, Model 57R2
	Knob	36K635858	On-off volume, Model 57R2
	Knob	36K635859	Tuning, Blue, Model 57R3
	Knob	36K635860	On-off volume, blue, Model 57R3
	Knob	36K635861	Tuning, Off-white, Model 57R4
	Knob	36K635862	On-off volume, Off-white, Model 57R4



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	1.4Ω	24Ω	12Ω	†1000Ω	†1000Ω	4.3Meg
V2	12BA6	4.3Meg	0Ω	24Ω	35Ω	†1000Ω	†1000Ω	100Ω
V3	12AV6	6.8Meg	0Ω	0Ω	12Ω	1Meg	0Ω	†470K
V4	50C5	150Ω	470K	80Ω	35Ω	470K	†1000Ω	†200Ω
V5	35W4	TP	TP	80Ω	115Ω	115Ω	107Ω	10K

† MEASURED FROM PIN 7 OF V5.
TP TIE POINT

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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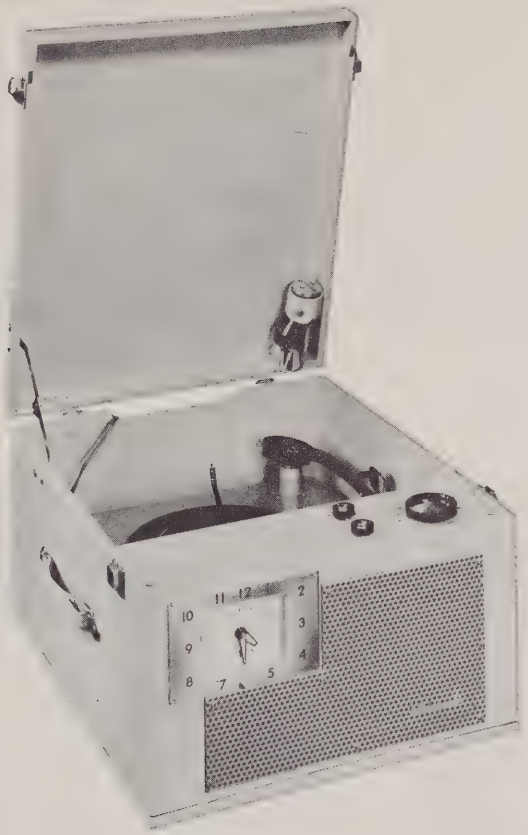

PHILCO
MODEL D-1345

PHILCO
MODEL D-1345

TRADE NAME	Philco Model D-1345
MANUFACTURER	Philco Corp., Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET	AC Operated AM Receiver With 3 Speed Automatic Record Changer And Electric Clock
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 35C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles — RATING .26 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	1620KC *	"	A5	* Fully open tuning gang, place a .006 shim beneath heel of rotor and close gang until it holds shim in place. Remove shim without disturbing setting of gang. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	"	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

RECORD CHANGER UNIT - PHILCO MODEL M-26

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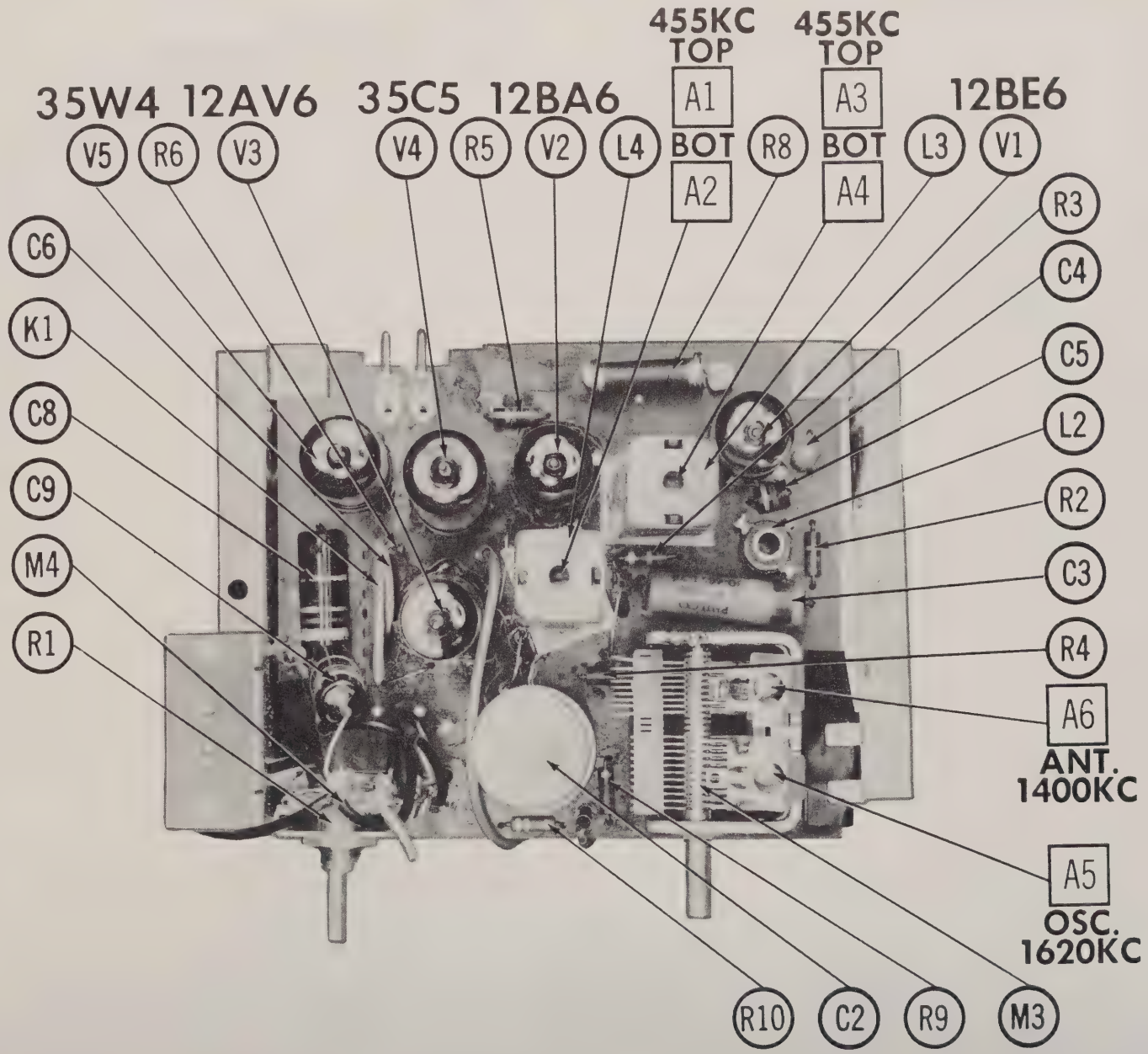


CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det.-AVC-AF Amplifier	12AV6	
V4	Output	35C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■25	150	30-2584-4	AFH3-08	CO060	FP311.4	TMT-7	T-035	TVL-3437
B	▲30	150							
C	20	150							
C2A	▲70	150	30-2585-6			FP311.66			TVL-3443.3
B	■15	150							
C	15	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	.047	200	30-4650-45	BPD-05	DF-503	CUB2S47		GEM-2147	2TM-S47	
C4	9		30-1251-5							
C5	47		30-1230-4	NPO-SI47	TCZ-47	TZ22	TCO-47	ZT-5447	5TCC-Q47	
C6	10000		30-1238-2	BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C7	.01	400	30-4650-58	BPD-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C8	.047	400	30-4650-45	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C9	.047	400	30-4650-45	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	470K	½	33-5565-100	B-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	NOTES
R2	22K		66-3228340	BTS-22K	
R3	68Ω		66-0688340	BTS-68	
R4	2.2Meg		66-5228340	BTS-2.2Meg	
R5	150Ω		66-1158340	BTS-150	
R6	150Ω		66-1158340	BTS-150	
R7	470K		66-4478340	BTS-470K	
R8			33-1360-6		Note 1
R9	2200Ω		66-2228340	BTS-2200	
R10	3300Ω		66-2338340	BTS-3300	

Note 1. Special temperature compensation resistor.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2400Ω	3-4Ω	32-8384-2	Z1101	A-3025	A-3332	26S58	S-12X	

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA PHILCO PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	36-1654-12	4A1	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Stick	76-10001-1				
L2	Osc. Coil	32-4582-5				
L3	Input IF	32-4583-5	16-6780		13-PC1	
L4	Output IF	32-4583-6	16-6780		13-PC2	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PHILCO PART No.	REPLACEMENT DATA
K1	Detector - Audio Network	6.8Meg, 470K, 470K, 220MMF, 5000MMF, 5000MMF, 250MMF	30-6006	Aerovox PA-512 Centralab PC-158 Sprague DT-5

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA PHILCO PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M1	425-0011					

PHONO NEEDLE

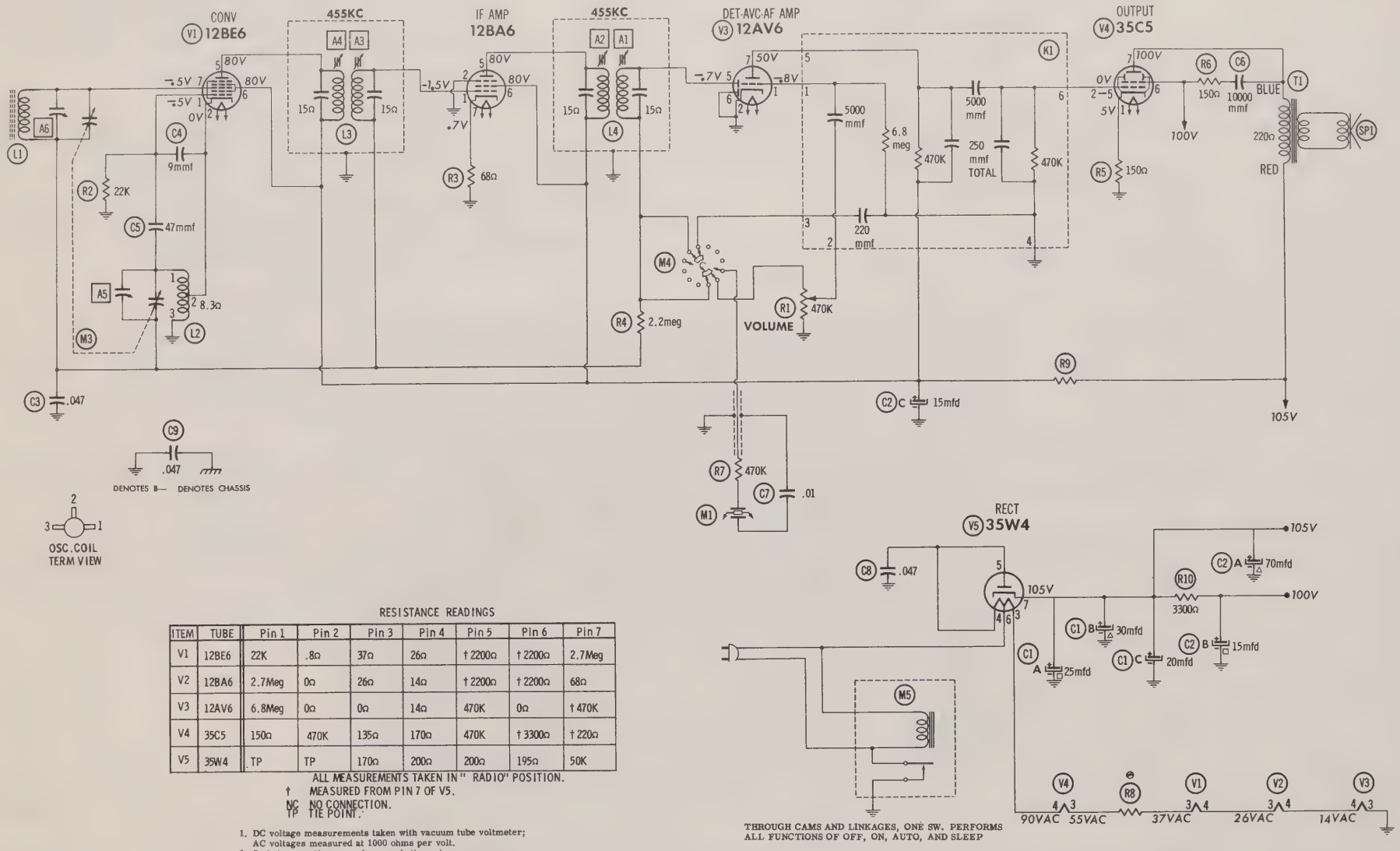
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA PHILCO PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2	45-9784	*PH-12 or †PH-13 or ♦†PH-133D or ♦PH-13D	†W-46TPS or †♦W-46DS or ♦W-46TPD	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M3	Tuning Cap.	31-2780-2	2 Gang
M4	Switch	42-2058	Radio-Phono (DPDT-Rotary, Wafer Type)
M5	Clock	41-2057-5	
	Printed Panel	54-6182-1	
	Cabinet	1163	
	Handle	76-10009	
	Knob	54-6095-2	Radio-Phono Switch
	Knob	54-6147-21	Tuning
	Knob	54-6095-3	Volume
	Knob	54-6096-3	Amber (Clock)
	Knob	54-4983-7	Black (Clock)
	Crystal	54-6226	Clock
	Face	28-10904-5	Clock

PHILCO MODEL D-1345



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.8Ω	37Ω	26Ω	† 2200Ω	† 2200Ω	2.7Meg
V2	12BA6	2.7Meg	0Ω	26Ω	14Ω	† 2200Ω	† 2200Ω	68Ω
V3	12AV6	6.8Meg	0Ω	0Ω	14Ω	470K	0Ω	† 470K
V4	35C5	150Ω	470K	135Ω	170Ω	470K	† 3300Ω	† 220Ω
V5	35W4	TP	TP	170Ω	200Ω	200Ω	195Ω	50K

ALL MEASUREMENTS TAKEN IN " RADIO" POSITION.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION.
TP TIE POINT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

THROUGH CAMS AND LINKAGES, ONE SW. PERFORMS ALL FUNCTIONS OF OFF, ON, AUTO, AND SLEEP

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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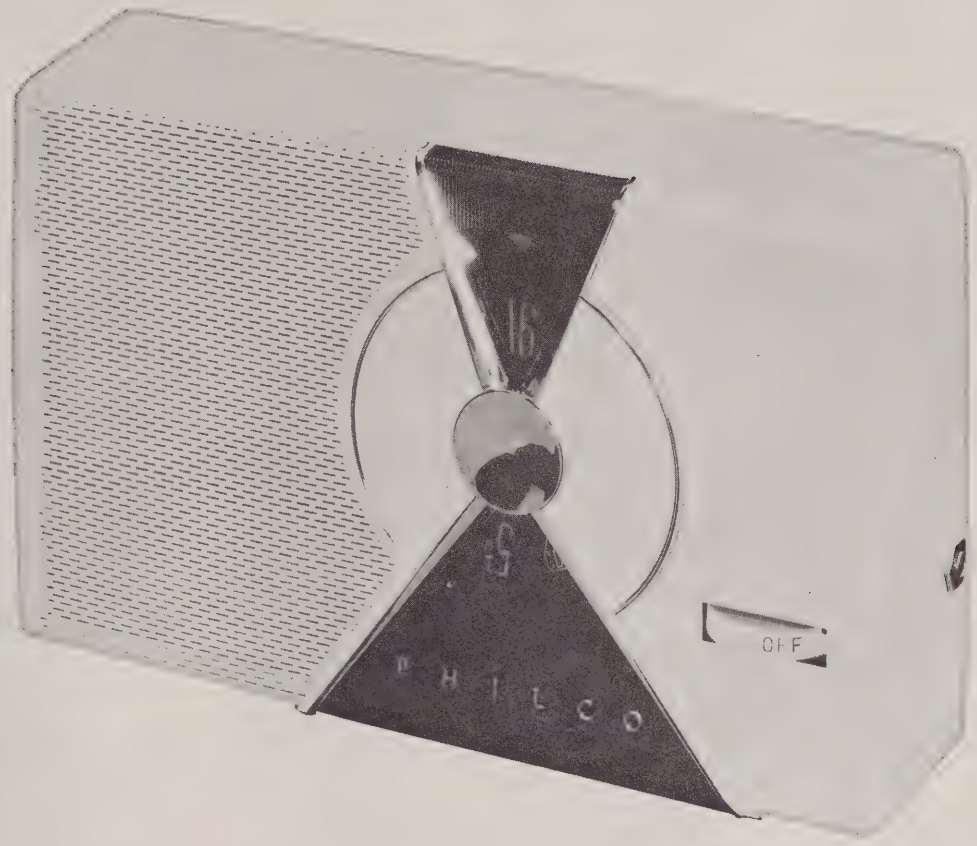
PHILCO
MODEL T-7



PHILCO
MODEL T-7

TRADE NAME	Philco Model T-7
MANUFACTURER	Philco Corp., Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	3 Volts DC RATING 17MA @ 3 Volts DC
TUNING RANGE—BROADCAST	540KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to ant. stator lug on tuning gang. Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	600KC	600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Rock tuning gang while making this adjustment.
3.		"	1620KC	Tuning gang fully open	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	1400KC	Tune to 1400KC signal	"	A7	"

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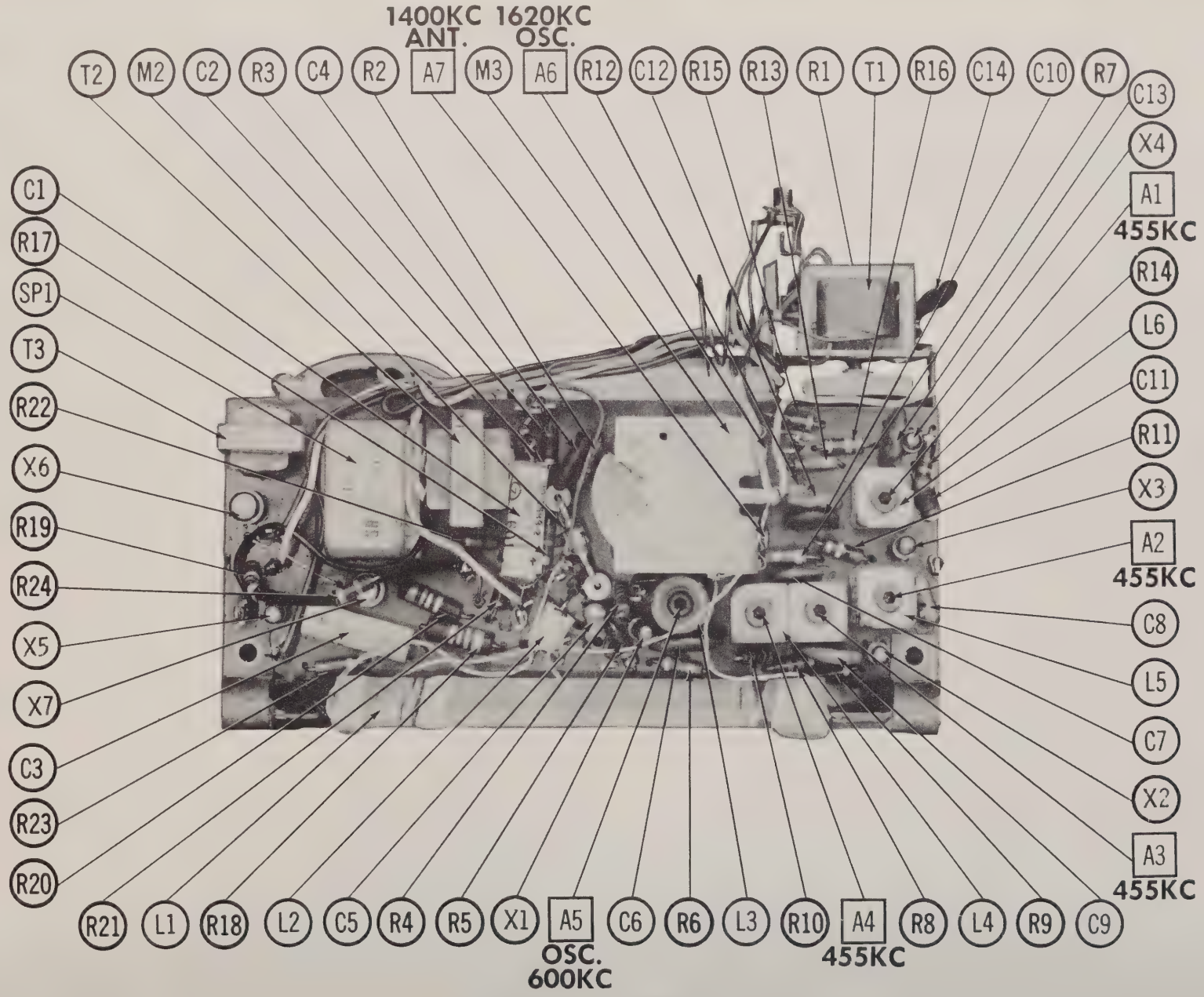


CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	USE	TYPE	PHILCO Part No.
X1	Converter	L-5113L	34-6000-3
X2	1st. IF Amplifier	L-5114L	34-6000-4
X3	2nd. IF Amplifier	L-5114L	34-6000-4
X4	Detector	L-5113L	34-6000-4
X5	AF Amplifier	L-5021L	34-6001-9
X6	Output	L-5028 *	34-6005 *
X7	Output	L-5028 *	34-6005 *

* X6 and X7 must be a matched pair.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	100	3	30-2588-2	SRE3V100	BBR100-6T		ML100-3		TE-1102
C2	100	3	30-2588-2	SRE3V100	BBR100-6T		ML100-3		TE-1102
C3	100	3	30-2588-2	SRE3V100	BBR100-6T		ML100-3		TE-1102

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	20000		30-1238-5	BPD-02	DD-203	K085	ED-02		5HK-S2	Note 1
C5	470		62-147001001	SI 470	D6-471	TP46	GP-470	UC-5347	5GA-T47	
C6	5000		30-1238-1	BPD-005	DD-502	K080	ED-005	DC525	5HK-D5	
C7	10000		30-1238-2	BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C8	47		62-047409011	NP0-SI 47	D6-470	TZ22	TCO-47	ZT-5447	5TCC-Q47	
C9	40000		30-1260-1	BPD-04						
C10	10000		30-1238-2	BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C11	12		62-012409011	1469-000012	D6-120	TZ10	TCO-12			
C12	100000		30-1260							
C13	20000		30-1238-5	BPD-02	DD-203	K085	ED-02		5HK-S2	
C14	10000		30-1238-2	BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	

Note 1. Some versions may use .01MFD in this application (Part #30-1238-6).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	15K	½	33-5583					Volume & switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHILCO PART No.	IRC PART No.	
R2	820Ω		66-1828340	BTS-820	
R3	1000Ω		66-2108340	BTS-1000	
R4	33K		66-3338340	BTS-33K	
R5	22K		66-3228340	BTS-22K	
R6	4700Ω		66-2478340	BTS-4700	
R7	4700Ω		66-2478340	BTS-4700	
R8	18K		66-3188340	BTS-18K	
R9	2200Ω		66-2228340	BTS-2200	
R10	3300Ω		66-2338340	BTS-3300	
R11	100K		66-4108340	BTS-100K	
R12	4700Ω		66-2478340	BTS-4700	
R13	270Ω		66-1278340	BTS-270	
R14	82Ω		66-0828340	BTS-82	
R15	82Ω		66-0828340	BTS-82	
R16	330Ω		66-1338340	BTS-330	
R17	2700Ω		66-2278340	BTS-2700	
R18	3.3Ω		66-9334360	BW½-3.3	
R19	390Ω			BTS-390	Note 2
R20	2.2Ω		66-9228360	BW½-2.2	
R21	47Ω 5%		66-0478240	BTS-47	
R22	1000Ω 5%		66-2108240	BTS-1000	
R23	150Ω		66-1158340	BTS-150	
R24	180Ω			BTS-180	Note 1

Note 1. Not used in some versions.
Note 2. Some versions may use 120Ω in this application (Part #66-1128340).

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (INPUT)

ITEM No.	Resistance		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
	Turns Ratio								
T1	178Ω	186Ω	32-8742				TR-1 ①		① Do not use center taps on windings.
	1: .7								

TRANSFORMER ~~(AUDIO OUTPUT)~~

ITEM No.	Resistance		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
	Turns Ratio								
T2	75Ω	58Ω CT	32-8741				TR-1 ①		① Do not use center tap on primary winding.
	.85 : 1								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	9500Ω CT	15Ω	32-8743						

SPEAKER

ITEM No.	TYPE				REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.		PHILCO PART No.	QUAM PART No.	
SP1	2 3/4"	PM	15Ω		36-1664-2		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	32-4668				
L2	Ant. Choke	32-4685			4652 ■	1 Millihenry, wound on 680Ω resistor
L3	Osc. Coil	32-4669				
L4	1st. IF Trans.	32-4667-2				
L5	2nd. IF Trans.	32-4667-1			2041	
L6	3rd. IF Trans.	32-4667			2042	

■ Parallel with 680Ω resistor.

BATTERIES

ITEM No.	VOLTAGE	PHILCO PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1	1½V	P-920	950			2R			Connect two in series

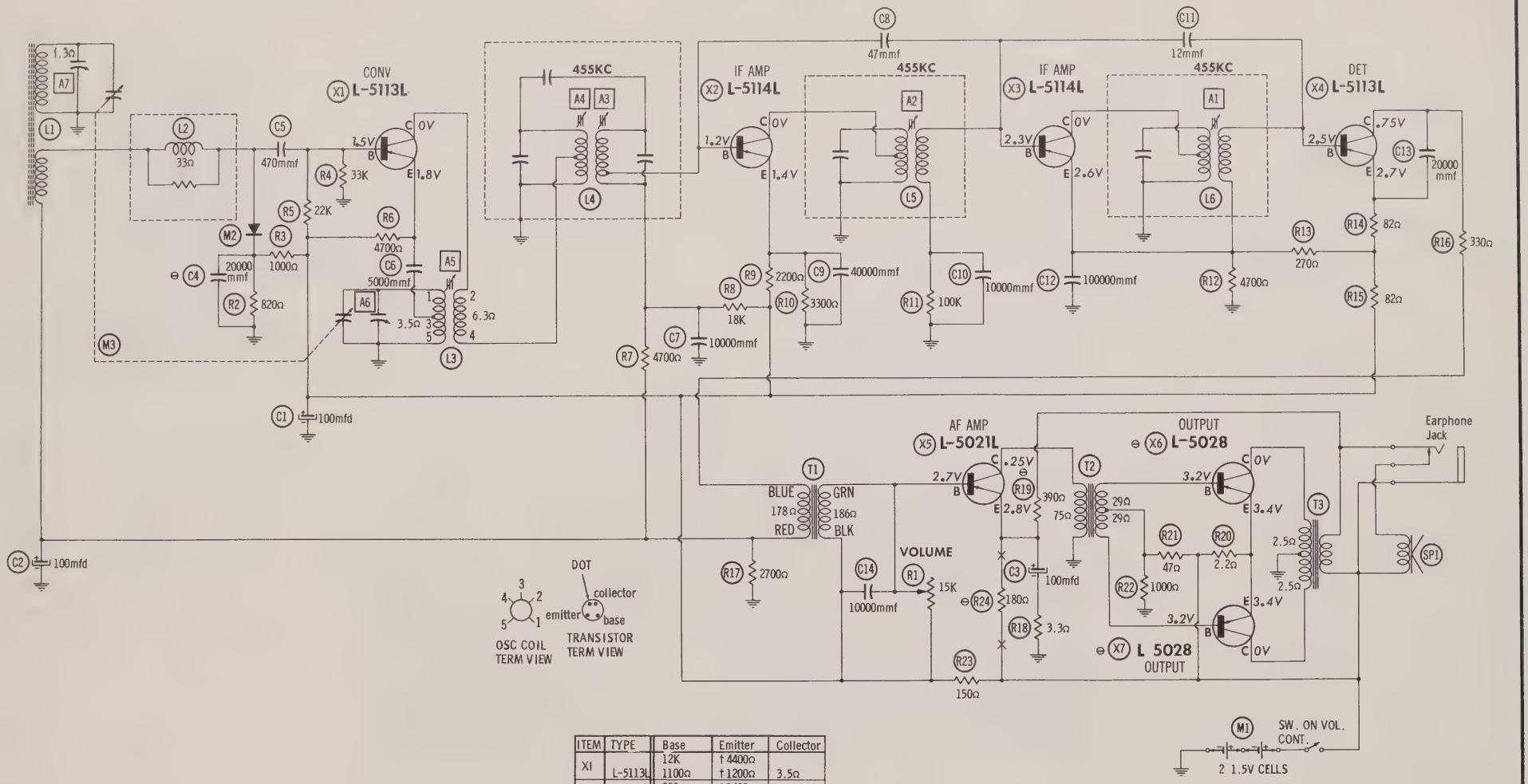
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		PHILCO PART No.	SYLVANIA PART No.	
M2	1N537	34-8038		Pigtail

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M3	Tuning Cap.	31-2782	Two Gang
	Panel	54-6255	Printed
	Cabinet	1118I-1	
	Knob	54-6256-1	Volume
	Knob	54-6257	Tuning

PHILCO MODEL T-7



ITEM	TYPE	Base	Emitter	Collector
X1	L-5113L	12K 1100Ω	†4400Ω †1200Ω	3.5Ω
X2	L-5114L	800Ω 1400Ω	†1400Ω †850Ω	1.6Ω
X3	L-5114L	1100Ω 25K	†210Ω †180Ω	1.2Ω
X4	L-5113L	700Ω 500Ω	†260Ω †240Ω	2500Ω
X5	L-5021L	250Ω 400Ω	†125Ω †55Ω	65Ω
X6	L-5028	200Ω 400Ω	†2.2Ω	2.5Ω
X7	L-5028	200Ω 400Ω	†2.2Ω	2.5Ω

† MEASURED FROM JUNCTION OF R23 AND R24. DUAL READINGS INDICATE REVERSAL OF METER LEADS.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

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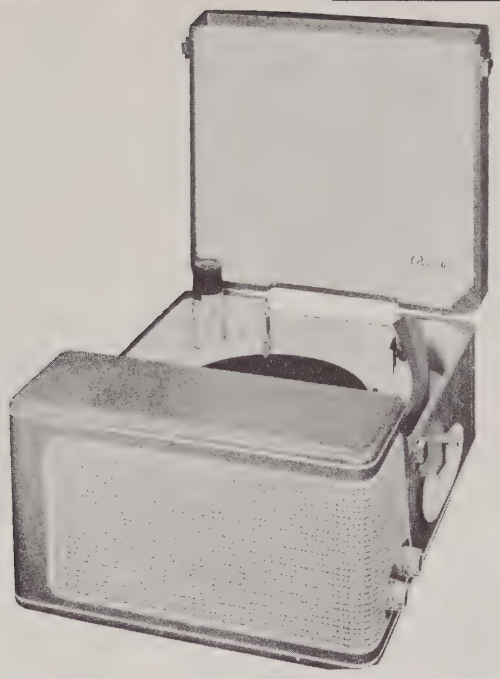
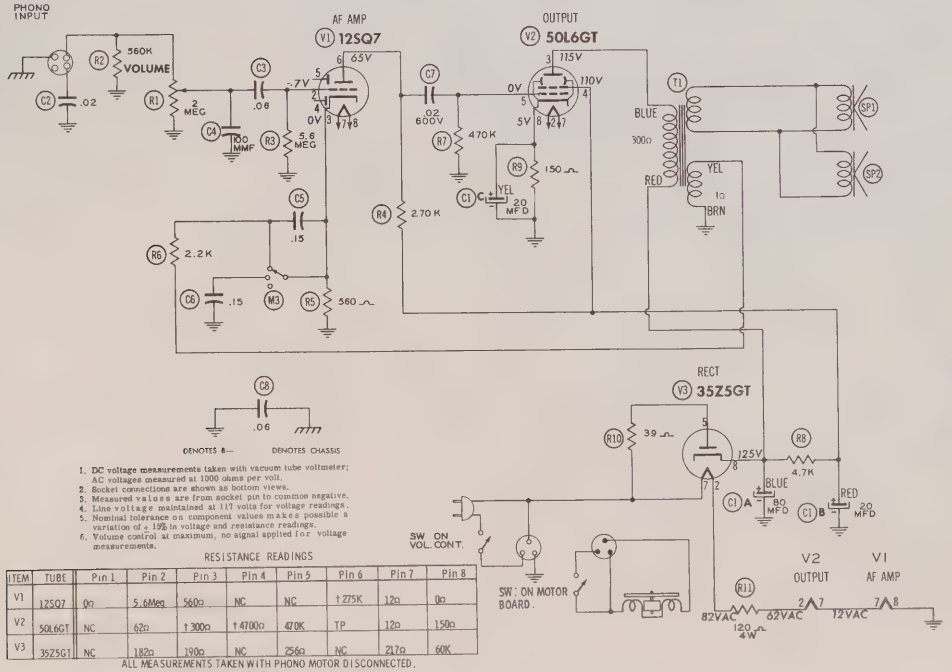
PHONOLA
MODELS 655, 855



TRADE NAME	Phonola Models 655 (Manual Record Player), 855 (Automatic Record Changer)
MANUFACTURER	Waters Conley Co., Inc., Rochester, Minn.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Manual or Automatic Record Unit
TUBES (Three)	Types 12SQ7 AF Amplifier, 50L6GT Output, 35Z5GT Rectifier
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING .22 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M MODEL 950 - PHOTOFACT SET 216-FOLDER 11 OR RECORD CHANGER MANUAL CM-5.



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	12SQ7	0Ω	5.6Meg	560Ω	NC	NC	†275K	12Ω	0Ω
V2	50L6GT	NC	62Ω	†300Ω	†4700Ω	470K	TP	12Ω	150Ω
V3	35Z5GT	NC	182Ω	190Ω	NC	256Ω	NC	217Ω	60K

ALL MEASUREMENTS TAKEN WITH PHONO MOTOR DISCONNECTED.
† MEASURED FROM PIN 8 OF V3.
TP TIE POINT
NC NO CONNECTION

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347-12

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12SQ7	
V2	Output	50L6GT	
V3	Rectifier	35Z5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PHONOLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	11504	PRS150/25V	BBRT8415C	TCT3117	TDLT-7	FMT-333	R2199*
B	20	150		8040/20					
C	20	25							

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PHONOLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.02	200	11508	BPD-02	DD-203	CUB2S2	817-02	PT412	2TM-S2	
C3	.06	200	11509	P288N-06		CUB6S6		PT616	6TM-S6	
C4	100		11534	BPD-0001	DD-101	G042	801-101	UC-531	5GA-T1	
C5	.15	200	11510	P288N-15		CUB2P15		PT4015	2TM-P15	
C6	.15	200	11510	P288N-15		CUB2P15		PT4015	2TM-P15	
C7	.02	600	11508	BPD-02	DD-203	CUB6S2	817-02	PT612	6TM-S2	
C8	.06	200	11509	P288N-06		CUB6S6		PT616	6TM-S6	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHONOLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2Meg	½	11512					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHONOLA PART No.	IRC PART No.	
R2	560K		8842	BTS-560K	
R3	5.6Meg		10301	BTS-5.6Meg	Note 1
R4	270K		8841	BTS-270K	
R5	560Ω 5%		10921	BTS-560 5%	
R6	2200Ω		10986	BTS-2200	
R7	470K		10305	BTS-470K	
R8	4700Ω		10429	BTS-4700	
R9	150Ω		9897	BTS-150	
R10	39Ω		10428	BTS-39	
R11	120Ω	4	10306	1 3/4A-125	

Note 1: Model 655 uses 1.2Meg in this application. (Part #9893)

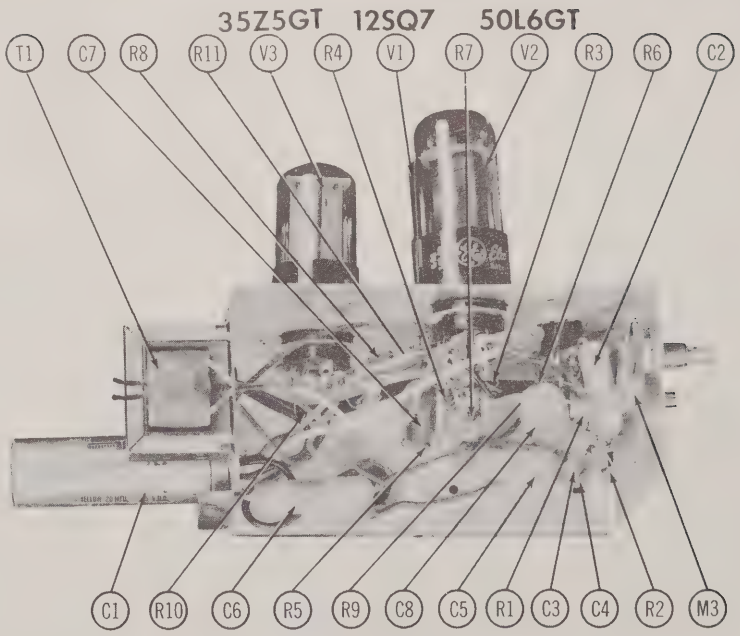
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PHONOLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2300Ω	1.4Ω SEC. 2 1Ω RES.	11503						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHONOLA PART No.	QUAM PART No.	
SP1	5 1/4"	PM	2.7Ω	10901	52A1	① Used in model 655.
SP2	6"	PM	3.1Ω	11505	6A1	
	4"	PM	3.1Ω	11792 ①	4A07	

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA						REMARKS
	PHONOLA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.			
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT		
M1	11406 ① (or) 11864 ②	55-T *P66-T	GD-J	56 *24H60	PT-2	① Model 855. ② Model 655. * Complete tone arm and cartridge assembly	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL NEEDLE CARTRIDGE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	PHONOLA PART No.	JENSEN PART No.	WALCO PART No.	
M2	11889 (Note 1)	*A-72 or †A-71 or ♦†A-71SD or ♦A-71D	*W-8TPA or †W-8TPS or ♦†W-8DS or ♦W-8TPD	* Metal † Jewel ♦ Diamond Note 1: Model 655. Note 2: Model 855.
	11407 (Note 2)	*S-67 or †S-66 or ♦†S-66SD or ♦S-66D	†W-75TPS or ♦†W-75DS or ♦W-75TPD	

MISCELLANEOUS

ITEM No.	PART NAME	PHONOLA PART No.	NOTES
M3	Switch	11513	Tone (Rotary-Wafer Type, SP-3 Position)
	Case	11480	
	Knob	11844	On-Off-Volume & Tone Sw.
	Handle	11843	

RCA VICTOR MODEL 7-HF-4 (Ch. RS-146F)

RCA VICTOR MODEL 7-HF-4 (Ch. RS-146F)

RCA VICTOR MODEL 7-HF-4 (Ch. RS-146F)

TRADE NAME	RCA Victor Model 7-HF-4 (Ch. RS-146F)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 8, N. J.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Four)	Types 6C4 1st AF Amplifier, 12AX7 2nd AF Amp. -Phase Inv., (2) 50C5 Output
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING .36 Amp. @ 117 Volts AC

RECORD CHANGER UNIT - RCA VICTOR MODEL RP-205-2

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PARTS LIST AND DESCRIPTIONS

RCA VICTOR
MODEL 7-HF-4 (Ch. RS-146F)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st AF Amplifier	6C4	
V2	2nd AF Amp. -Phase Inv.	12AX7	
V3	Output	50C5	
V4	Output	50C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	78617	PRS150V8040 20	BBRT84215	TCT3117		FMT-339	TVA-3455
B	30	150							
C	10	150							
C2	50	6	78573	SRE50	BBR50-6	TC29	TD-50-6		TVA-1100
C3	8	10	100509	PRS-AC 10VAC8		TC108		MMT-0220 † MMT-0220 †	R2201*

† Connect negative leads together.
*Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	.047	400	73553	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C5	1800		74850	SI 1800	D6-182	TP55	GP-1800	UC-5218	5GA-D18	
C6	.01	200	101000	BPD-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C7	.01	400	73561	BPD-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C8	.001	600	75249	BPD-001	D6-102	TP50	GP-1000	GEM-621	6TM-D1	
C9	.047	400	73553	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C10	.0015	600	76508	BPD-0015	D6-152	CUB6D15	GP-1500	GEM-6215	6TM-D15	
C11	.012	200	74938							
C12	.047	200	73558	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C13	.047	400	73553	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C14	.047	400	73553	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C15	.1	400	73551	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C16	.047	400	73553	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	102397	ABT-159		Q18-133XX	UDT-283	Loudness, Tap@ 84K & 165K
B	Shaft			AK-3		Not Req.	Not Req.	Attach to R1A
R2A	2Meg	½	102399	B-75	A47-2Meg-S	Q11-139	U56	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	100K	½	102398	B-41	A47-100K-Z	Q13-128	U39	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A

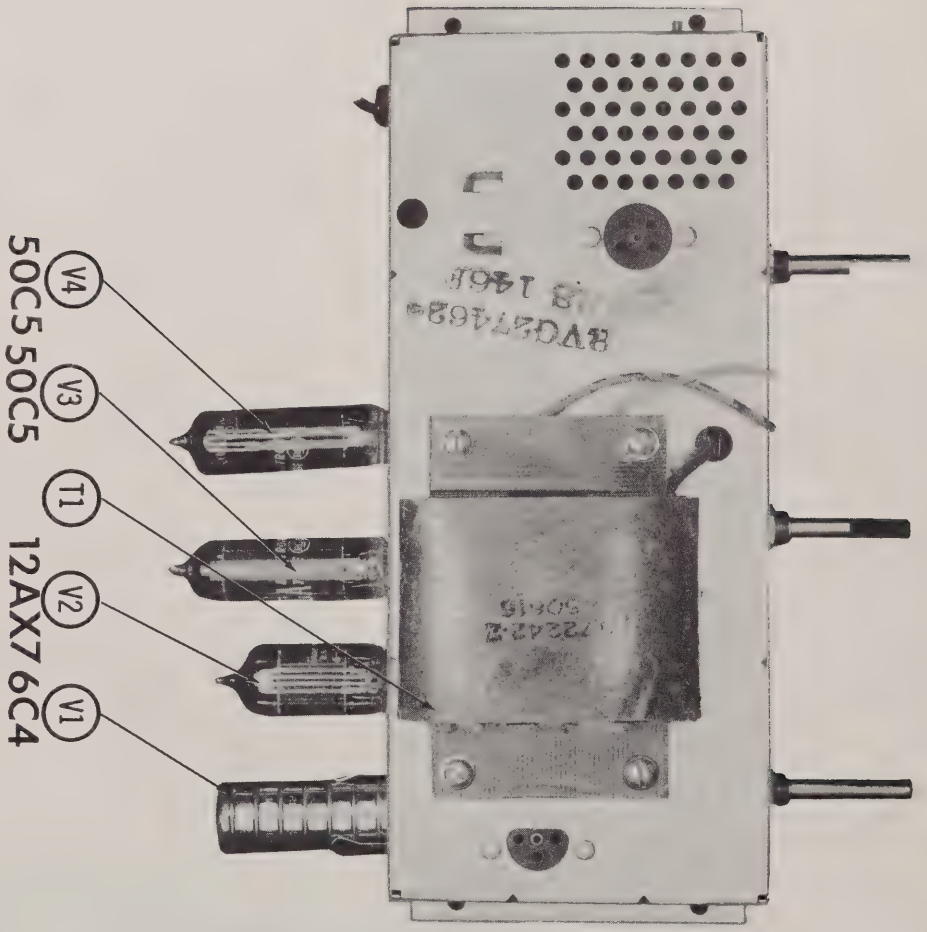
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA RCA Victor PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R4	390K		502439	BTS-390K	
R5	1.8Meg		502518	BTS-1.8Meg	
R6	4700Ω		502247	BTS-4700	
R7	15K		502315	BTS-15K	
R8	82K		502382	BTS-82K	
R9	3900Ω		502239	BTS-3900	
R10	220K		502422	BTS-220K	
R11	22K		502322	BTS-22K	
R12	8200Ω		502282	BTS-8200	
R13	220K		502422	BTS-220K	
R14	6800Ω		502268	BTS-6800	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA RCA Victor PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R15	220K		502422	BTS-220K	
R16	6800Ω		502268	BTS-6800	
R17	10K		502310	BTS-10K	
R18	470K		502447	BTS-470K	
R19	39K		502339	BTS-39K	
R20	18K		502318	BTS-18K	
R21	470K		502447	BTS-470K	
R22	82Ω	1	512082	BTA-82	
R23	100K		502410	BTS-100K	
R24	1200Ω	1	512212	BTA-1200	
R25	15Ω	1	512015	BTA-15	
R26	15Ω	1	512015	BTA-15	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4800Ω	3-4Ω	100940						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	QUAM PART No.	
SP1	8"	PM	3-4Ω	78597	8A31	
SP2	3½"	PM	6.6Ω	100465	3A15TZ6.6	
SP3	3½"	PM	6.6Ω	100465	3A15TZ6.6	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	RCA Victor PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.100A	100654	1005A	RS150	6S150	6P2	150	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	RCA Victor PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M2	100653	55-T	GD-J	56	PT-2	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

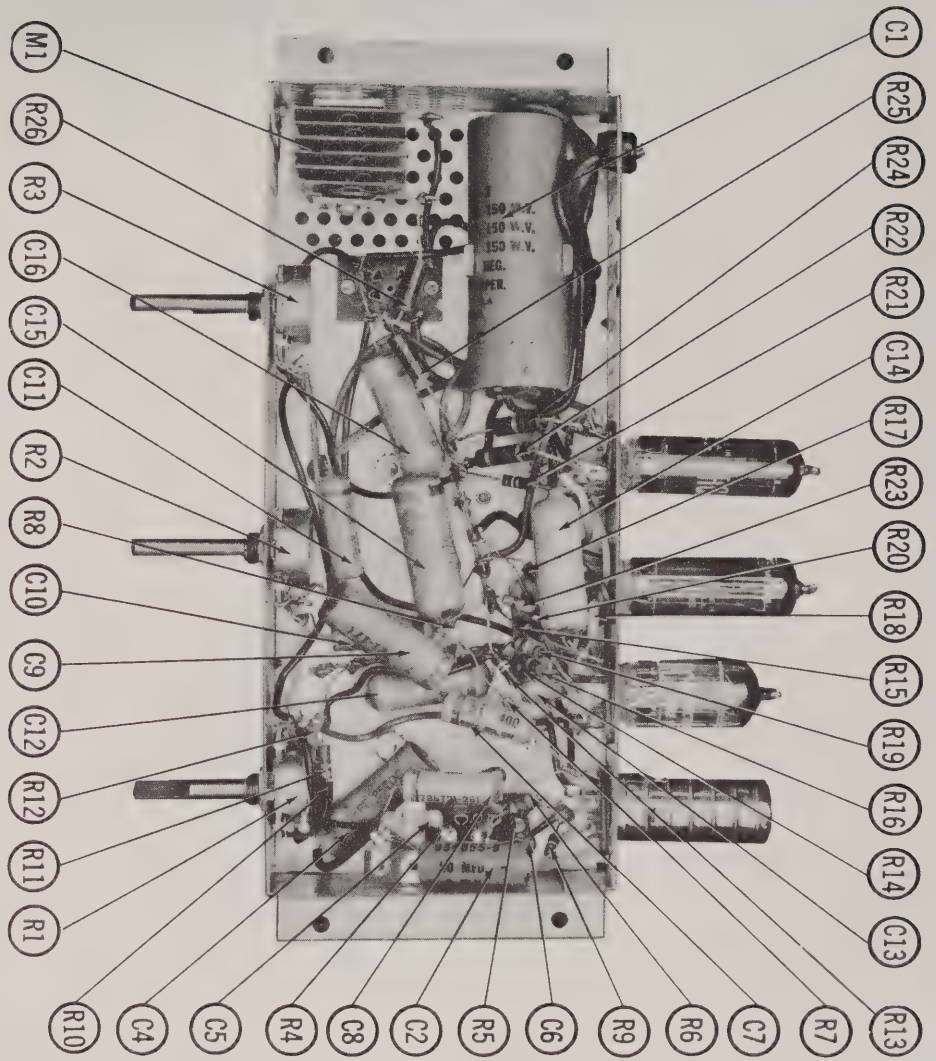
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

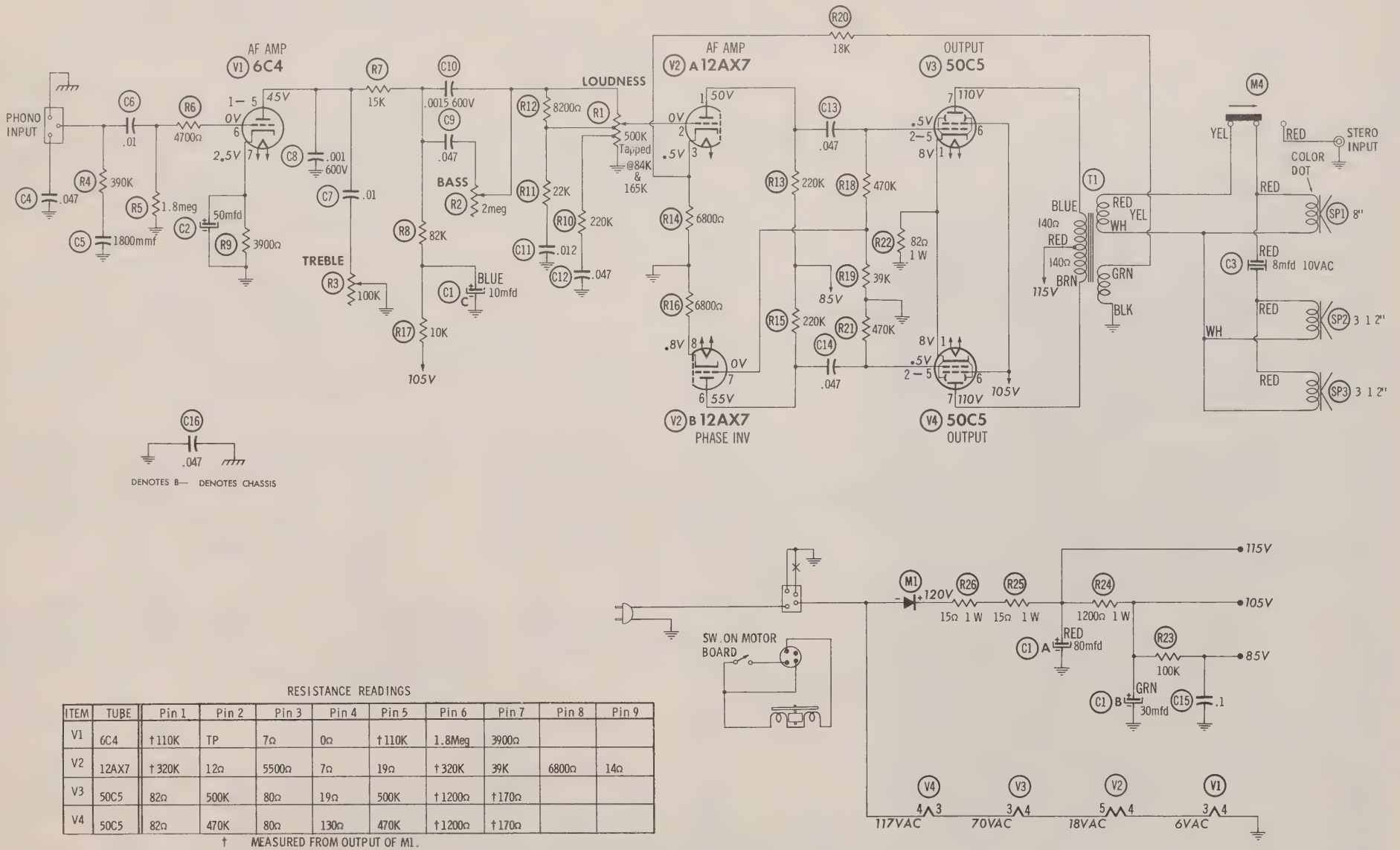
ITEM No.	REPLACEMENT DATA			REMARKS
	RCA Victor PART No.	JENSEN PART No.	WALCO PART No.	
M3		†S-66 or ♦†S-66SD or ♦S-66D	†W-75TPS or ♦†W-75DS or ♦W-75TPD	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M4	Normal-Stero Sw. Knob	100185 102347	SPST - Slide Type

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6C4	†110K	TP	7Ω	0Ω	†110K	1.8Meg	3900Ω		
V2	12AX7	†320K	12Ω	5500Ω	7Ω	19Ω	†320K	39K	6800Ω	14Ω
V3	50C5	82Ω	500K	80Ω	19Ω	500K	†1200Ω	†170Ω		
V4	50C5	82Ω	470K	80Ω	130Ω	470K	†1200Ω	†170Ω		

† MEASURED FROM OUTPUT OF M1.
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

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RCA VICTOR MODEL 21-T-7157U (Ch. KCS98C)

TRADE NAME	RCA Victor	MODELS	CHASSIS
		21-T-7112, 21-T-7113, 21-T-7117, 21-T-7152, 21-T-7153, 21-T-7157	KCS98A
		21-T-7112U, 21-T-7113U, 21-T-7117U, 21-T-7152U, 21-T-7153U, 21-T-7157U	KCS98C
		21-T-7352, 21-T-7355, 21-T-7357	KCS98E
		21-T-7352U, 21-T-7355U, 21-T-7357U	KCS98F
MANUFACTURER	Radio Corp. of America, RCA Victor Television Div., Camden 8, N. J.		
TYPE SET	Television Receiver		
TUBES	Eighteen		
POWER SUPPLY	110-120 Volts AC - 60 Cycles	RATING 1.52 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13VHF, 14 thru 83UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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RCA VICTOR MODELS 21-T-7112, U, 21-T-7113, U, 21-T-7117, U, 21-T-7152, U, 21-T-7153, U, 21-T-7157, U, 21-T-7352, U, 21-T-7355, U, 21-T-7357, U (Ch. KCS98A, C, E, F)

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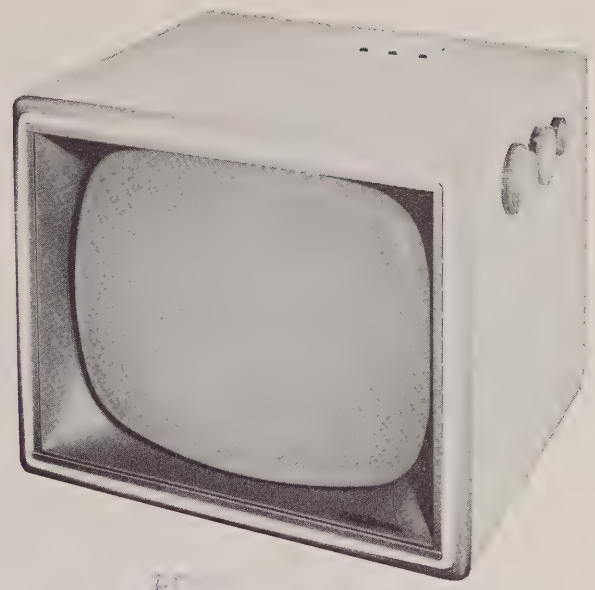
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 10 push-on type control knobs.
2. Remove 3 spring clips. Remove rear cover.
3. Remove tuner power plug, tuner output cable, picture tube socket, yoke plug, HV leads and speaker leads.
4. Remove 2 metal screws holding volume control panel.
5. Remove 2 hex nuts at top of chassis.
6. Remove 2 metal screws at bottom of chassis.
7. Remove chassis.
8. Remove 4 speaker nuts. Remove speaker.



MODEL	CHASSIS
21-T-7157U	KCS98C

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of VHF tuner oscillator, it is necessary to remove the chassis from the cabinet. (See disassembly instructions.)

PICTURE TUBE SAFETY GLASS CLEANING

Models 21-T-7152, U, 21-T-7153, U, 21-T-7157, U:

Remove 3 flat springs holding bottom metal trim from under front of cabinet. Press in on spring at open end to remove. Remove bottom metal trim. Remove safety glass.

Other Models:

Remove metal screws holding "U" shaped channel under front top edge of cabinet. Remove channel and safety glass.

Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

SPECIAL ADJUSTMENTS

Focus

Adjust Ion trap for best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The horizontal frequency coil is located on the control panel of the set and is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust ratio detector secondary (A15).

FUSE

One fuse is used for Horiz. Sweep Circuit protection. (For location see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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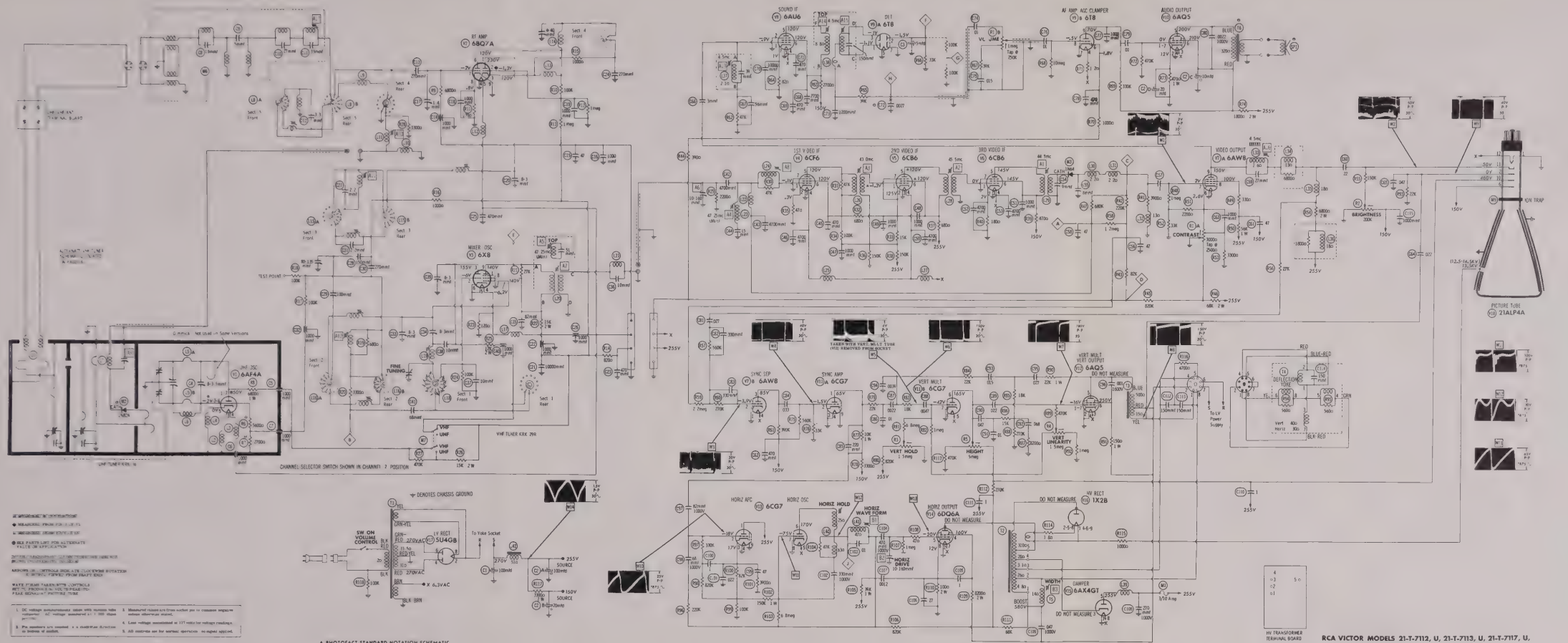

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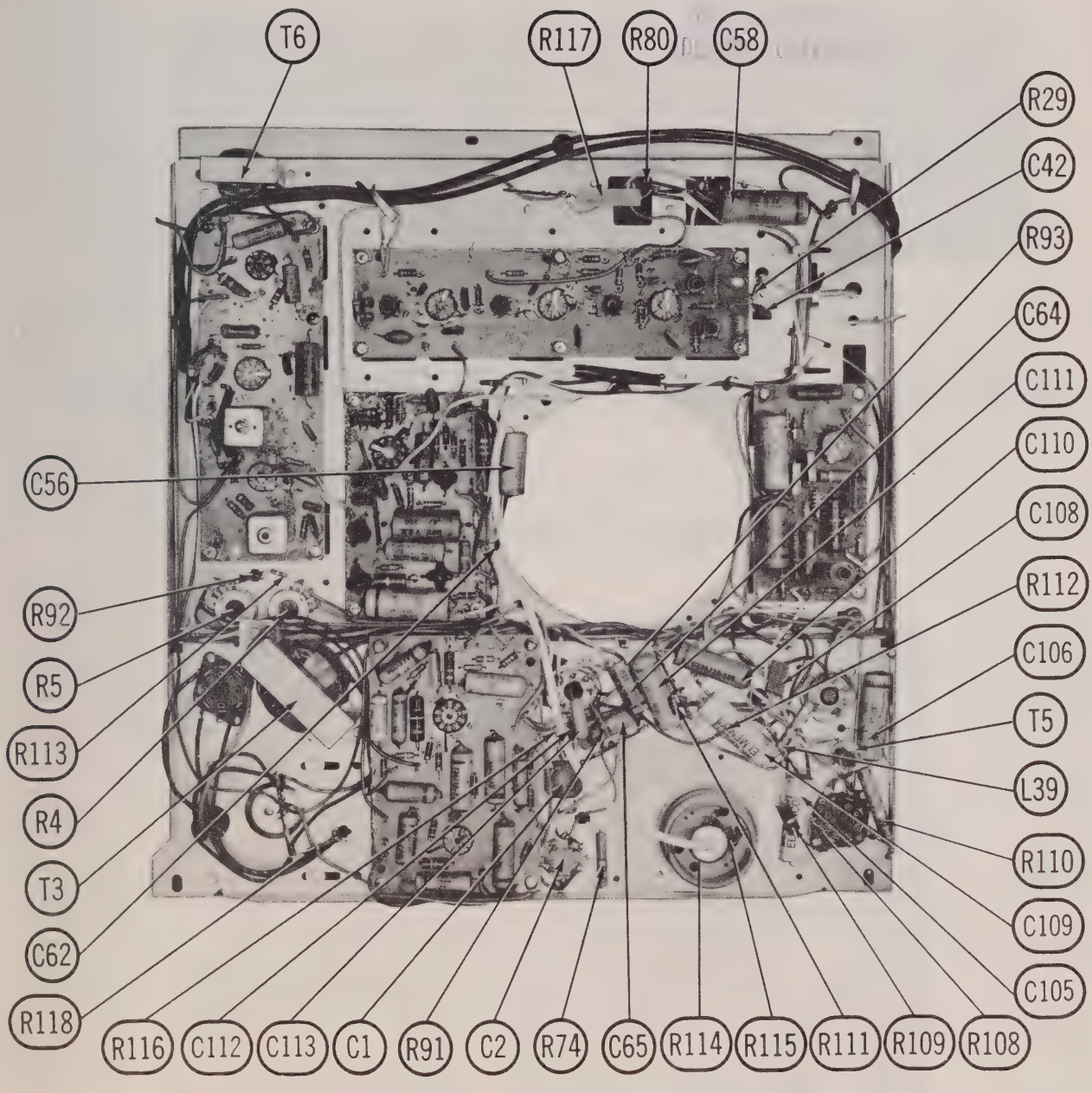
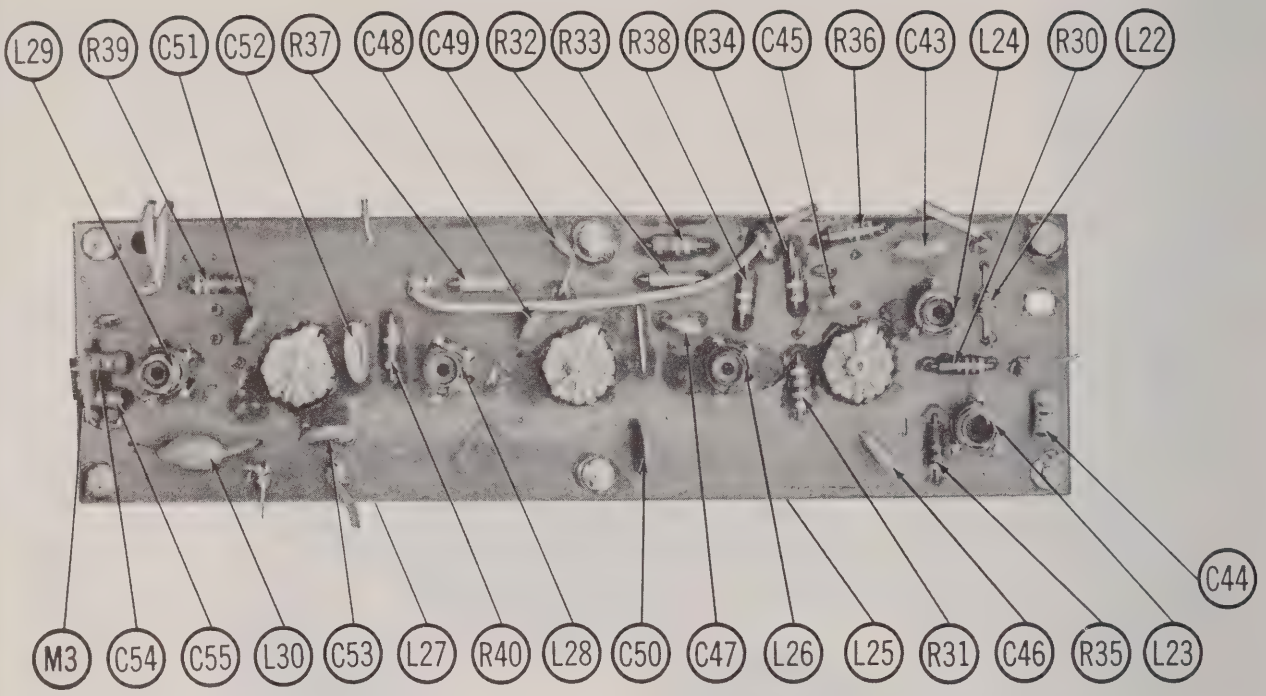
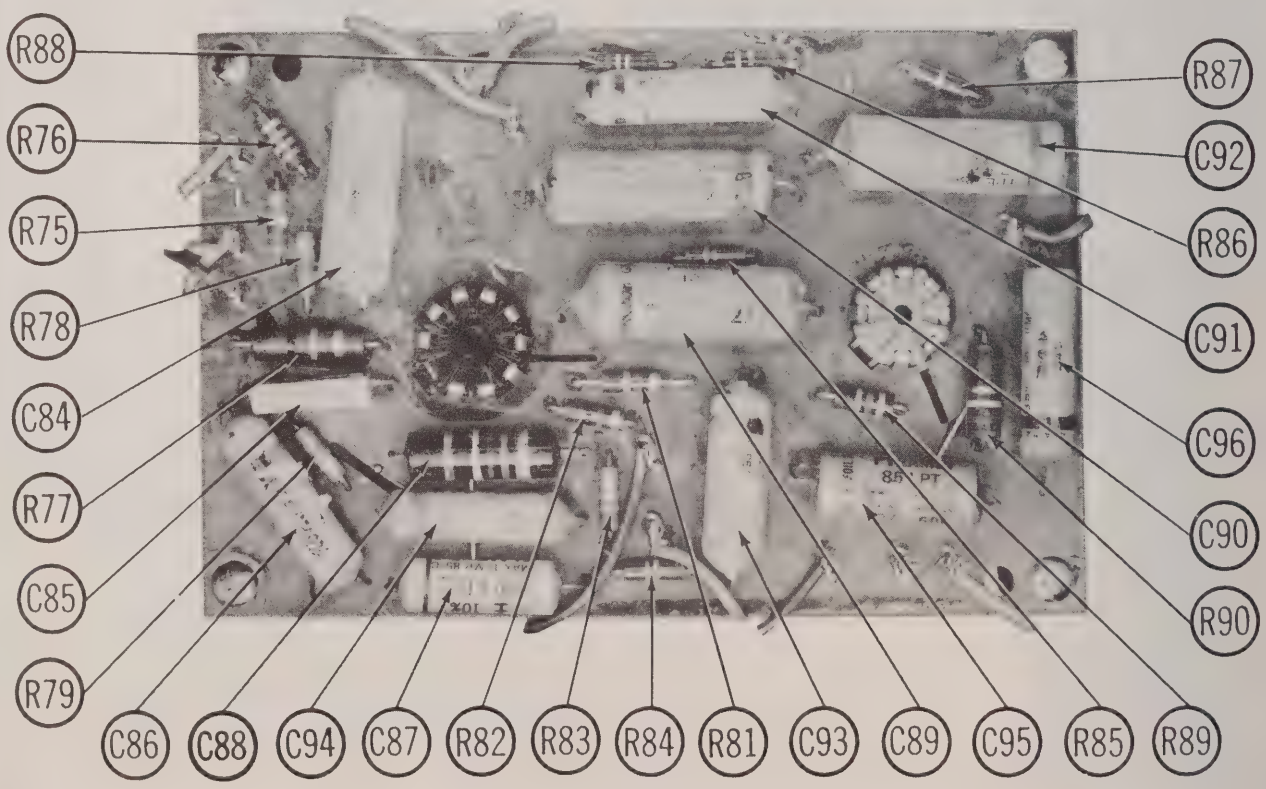


CHASSIS-BOTTOM VIEW

SET 347 FOLDER 14

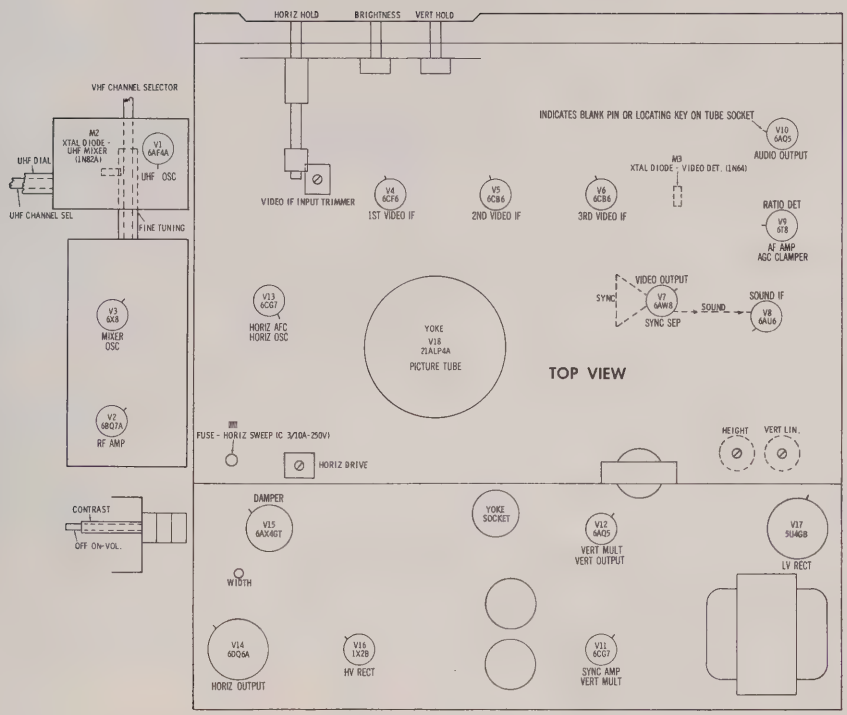


VIDEO IF PRINTED BOARD



VERTICAL PRINTED BOARD

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V17

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V4, V5, V6, Diode (M3), V7, V18
No pic, no sound, has snow - V2, V3, V4, V1 (UHF)
No pic, has sound, has raster - V7, V18
Has pic, no sound - V8, V9, V10

SYNC FAILURE
No vert. sync - V7, V11, V12
No horiz. sync - V7, V11, V13
No vert. or horiz. sync - V7, V11

SWEEP FAILURE
No raster, has sound - V13, V14, V15, V16, V18, Fuse (M1)
No vertical deflection - V11, V12
Poor vert. linearity or foldover - V11, V12
Poor horiz. linearity or foldover - V13, V14, V15
Narrow picture - V13, V14, V15, V17
Vert. off freq. - V7, V11, V12
Horiz. off freq. - V7, V11, V13

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect a 1000Ω potentiometer across a 7.5 volt bias battery capable of providing an appreciable current flow. Connect the negative lead of the battery to point Ⓐ. Connect the positive lead to chassis. Adjust the bias for -5 volts at point Ⓐ.
If necessary, reduce the signal to provide -3 volts at point Ⓒ with -5 volts at point Ⓐ.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1500MMF Ceramic Capacitor	High side to point Ⓑ. Low side to chassis.	Not used	44.5MC	Any unused channel	USE VTVM. DC probe to point Ⓒ. Common to chassis.	A1	Attenuate generator output to maintain not more than -3 volts on VTVM. Adjust for maximum deflection.
2.	"	"	"	45.5MC	"	"	A2	"
3.	"	"	"	43.0MC	"	"	A3	"
4.	"	"	"	47.25MC	"	"	A4, A5	Increase generator output to maintain -3 volts on VTVM. Adjust A4 and A5 for MINIMUM deflection.
5.	"	High side to point Ⓑ. Low side to tuner chassis.	44MC (10MC Swp)	42.5MC 45.75MC	4	Vert. Amp. of scope thru detector (Fig.1) to pin 5 (plate) of 1st. video IF amp. tube (V4). Low side to chassis.	A6, A7, A8	Adjust for -5 volts bias at point Ⓐ. Connect a 180Ω carbon resistor from plate to screen (pin 5 to pin 6 of 1st. video IF amp. tube (V4). Preset A6 (trimmer) to MINIMUM capacity. If a separate marker generator is used, couple it loosely to the detector network (Fig.1). Adjust A7 and A8 for maximum gain and adjust A6 to obtain the response with the markers located as shown in Fig. 2. Remove resistor.
6.	"	"	"	42.5MC 45.0MC 45.75MC	"	Remove detector probe (Fig.1). Vert. amp. thru 10K to point Ⓒ. Low side to chassis.	A1, A2, A3	Adjust sweep generator output to provide 5 volts peak to peak at point Ⓒ on scope. If a separate signal generator is used for a marker couple loosely to the grid (pin 1) circuit of 1st. video IF amp. (V4). Retouch A1, A2 and A3 if necessary to obtain response similar to Fig. 3.
7.	"	"	"	41.25MC	"	"	A1, A3	Increase sweep generator output 10 times and notice attenuation of 41.25MC. Adjust A1 and A3 to place 41.25MC marker at no more than 5% on response curve as in Fig. 4.
8.	Two 130Ω Carbon Resistors	Across VHF antenna terminals with 130Ω in each lead.	"	42.5MC 45.0MC 45.75MC	All VHF channels separately	"	A1, A2	Connect negative lead of 3 volt bias battery to point Ⓓ. Positive side to chassis. SLIGHTLY retouch A1 and A2 to correct for any overall tilt that is approximately the same on all channels.

UHF IF ALIGNMENT FOR UHF MODELS

Leave bias connected as under "Video IF Alignment".
Connect a 220Ω resistor in series with a 1500MMF ceramic capacitor between pin 1 (plate) of the 6BQ7A and chassis with the resistor next to chassis. The scope is to be connected to the junction of the resistor and capacitor.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	1000Ω Carbon Resistor in series with 1500MMF ceramic capacitor	High side to front terminal of 1N82 crystal holder. Low side to tuner chassis. Use very short leads.	800MC (10MC Swp)	41.25MC 45.75MC	Between channels 68 and 69	Vert. Amp. thru detector (Fig.1) to junction of 220Ω and 1500MMF dummy antenna. Low side to chassis.	A9, A10	Set tuner to UHF position. If a separate marker generator is used, couple it loosely to detector probe (Fig.1). Connect the negative lead of a second variable bias supply to point Ⓓ. Positive side to chassis. Adjust for -3 volts at point Ⓓ. Attenuate sweep generator for .5 volts peak to peak on scope. Adjust A9 and A10 for maximum gain and response as shown (Fig.5).
10.	"	"	"	"	"	Vert. Amp. thru detector probe (Fig. 1)to point Ⓔ. Low side to chassis.	A11, A12	Loosely couple marker generator to detector probe. Adjust A11 and A12 for response curve similar to Fig. 5 with markers as shown. Remove resistor, capacitor and detector probe and repeat step 8 to retouch A1 and A2.
11.	Fig. 6	Across UHF antenna terminals thru matching network (Fig. 6).	Set Freq. chart for UHF channels	42.5MC 45.0MC 45.75MC	Check all UHF channels	Vert. Amp. to point Ⓒ. Low side to chassis.	A11, A12	Couple marker generator loosely to 1st. video IF amplifier grid (pin 1). Check for response similar to Fig. 3 on all UHF channels. If necessary, SLIGHTLY retouch A11 and A12 to correct for any overall tilt. Do not retouch A1, A2, A3, A6, A7, A8, A9 or A10 in this step. Remove all test equipment and both bias supplies.

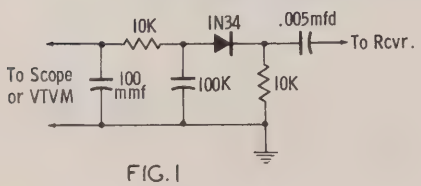


FIG. 1

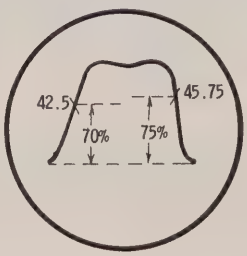


FIG. 2

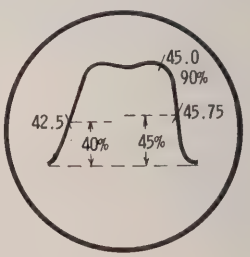


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

SOUND IF ALIGNMENT

Connect two matched 100K (±1%) resistors in series from point (F) to chassis. The junction of these two resistors is alignment point (G) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	.01MFD	High side to point (C). Low side to chassis.	4.5MC (Unmod)	Any unused channel	DC probe to point (F). Common to chassis.	A13, A14, A15	Adjust for maximum deflection. Peak A12 with core farthest away from chassis. The output level of the generator should be at such a level as to produce a reading of 10 to 12 volts on VTVM at point (F) after peaking adjustments.
13.	"	"	"	"	DC probe to point (H). Common to point (G).	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

Connect a clip lead from pin 1 (grid) of the 3rd. video IF amplifier (V6) to chassis. Set the contrast control fully clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	.01MFD	High side to point (C). Low side to chassis.	Not used	4.5MC (30% 400~ AM Mod.)	Any	Vert. Amp. thru detector probe (Fig.1) to pin 11 (cathode) of picture tube. Low side to chassis.	A16	Adjust for MINIMUM 400~ indication on scope. Remove the short from V6.

FM TRAP ALIGNMENT

Tune in a local TV station on which interference is noted. Adjust A17 for MINIMUM interference in picture.

TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

TELEVISION CHANNEL FREQUENCIES

Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier	Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier	Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier	Channel No.	Frequency Band (Mc)	Video Carrier	Sound Carrier
2	54-60	55.25	59.75	23	524-530	525.25	529.75	44	650-656	651.25	655.75	64	770-776	771.25	775.75
3	60-66	61.25	65.75	24	530-536	531.25	535.75	45	656-662	657.25	661.75	65	776-782	777.25	781.75
4	66-72	67.25	71.75	25	536-542	537.25	541.75	46	662-668	663.25	667.75	66	782-788	783.25	787.75
5	76-82	77.25	81.75	26	542-548	543.25	547.75	47	668-674	669.25	673.75	67	788-794	789.25	793.75
6	82-88	83.25	87.75	27	548-554	549.25	553.75	48	674-680	675.25	679.75	68	794-800	795.25	799.75
7	174-180	175.25	179.75	28	554-560	555.25	559.75	49	680-686	681.25	685.75	69	800-806	801.25	805.75
8	180-186	181.25	185.75	29	560-566	561.25	565.75	50	686-692	687.25	691.75	70	806-812	807.25	811.75
9	186-192	187.25	191.75	30	566-572	567.25	571.75	51	692-698	693.25	697.75	71	812-818	813.25	817.75
10	192-198	193.25	197.75	31	572-578	573.25	577.75	52	698-704	699.25	703.75	72	818-824	819.25	823.75
11	198-204	199.25	203.75	32	578-584	579.25	583.75	53	704-710	705.25	709.75	73	824-830	825.25	829.75
12	204-210	205.25	209.75	33	584-590	585.25	589.75	54	710-716	711.25	715.75	74	830-836	831.25	835.75
13	210-216	211.25	215.75	34	590-596	591.25	595.75	55	716-722	717.25	721.75	75	836-842	837.25	841.75
14	470-476	471.25	475.75	35	596-602	597.25	601.75	56	722-728	723.25	727.75	76	842-848	843.25	847.75
15	476-482	477.25	481.75	36	602-608	603.25	607.75	57	728-734	729.25	733.75	77	848-854	849.25	853.75
16	482-488	483.25	487.75	37	608-614	609.25	613.75	58	734-740	735.25	739.75	78	854-860	855.25	859.75
17	488-494	489.25	493.75	38	614-620	615.25	619.75	59	740-746	741.25	745.75	79	860-866	861.25	865.75
18	494-500	495.25	499.75	39	620-626	621.25	625.75	60	746-752	747.25	751.75	80	866-872	867.25	871.75
19	500-506	501.25	505.75	40	626-632	627.25	631.75	61	752-758	753.25	757.75	81	872-878	873.25	877.75
20	506-512	507.25	511.75	41	632-638	633.25	637.75	62	758-764	759.25	763.75	82	878-884	879.25	883.75
21	512-518	513.25	517.75	42	638-644	639.25	643.75	63	764-770	765.25	769.75	83	884-890	885.25	889.75
22	518-524	519.25	523.75	43	644-650	645.25	649.75								

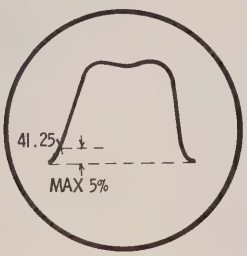


FIG. 4

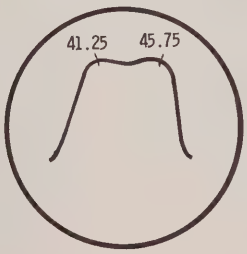


FIG. 5

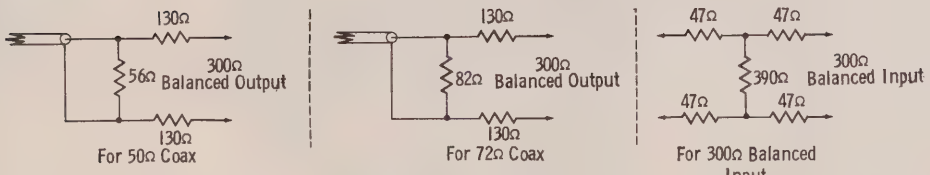
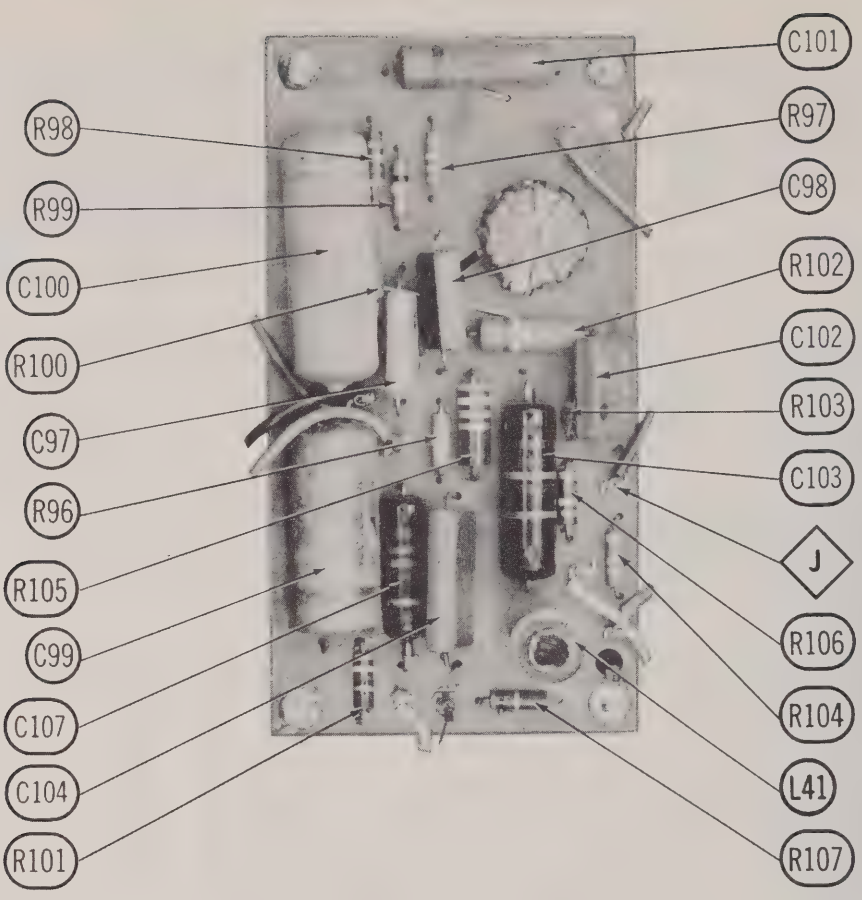


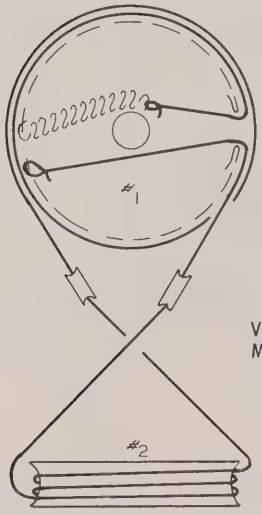
FIG. 6

RCA VICTOR MODELS 21-T-7112, U, 21-T-7113, U, 21-T-7117, U, 21-T-7152, U, 21-T-7153, U, 21-T-7157, U, 21-T-7352, U, 21-T-7355, U, 21-T-7357, U (Ch. KCS98A, C, E, F)



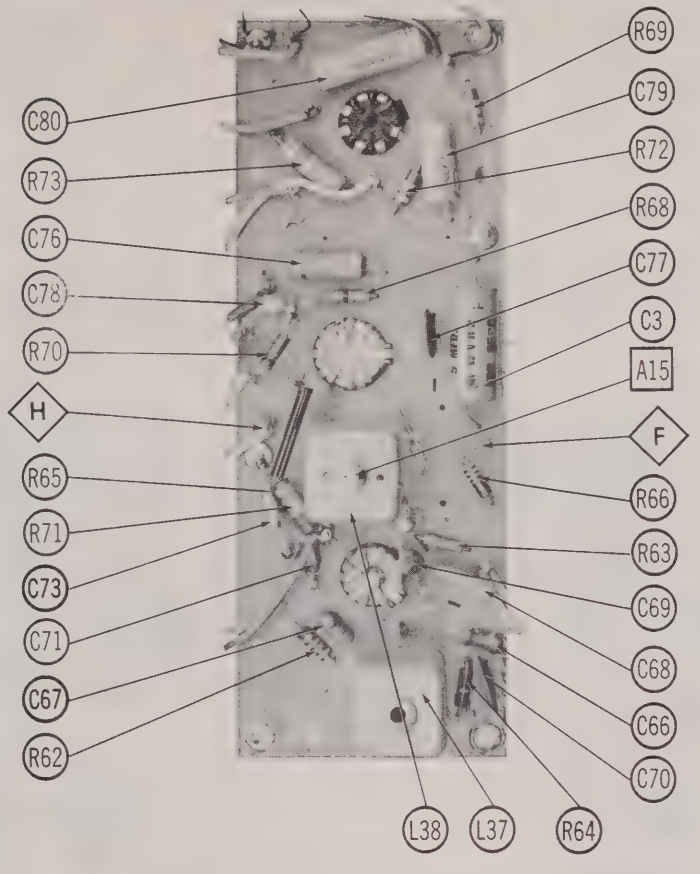
HORIZONTAL PRINTED BOARD

VHF FINE TUNING CORD DRIVE

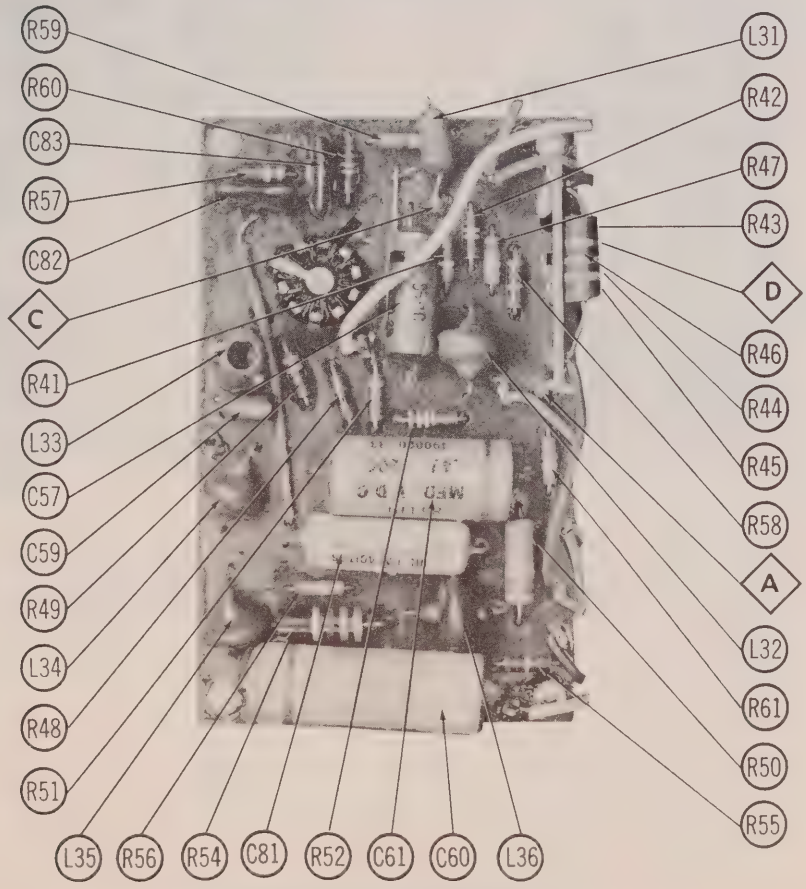


VHF FINE TUNING PULLEY #1 IN MAX. CLOCKWISE POSITION.

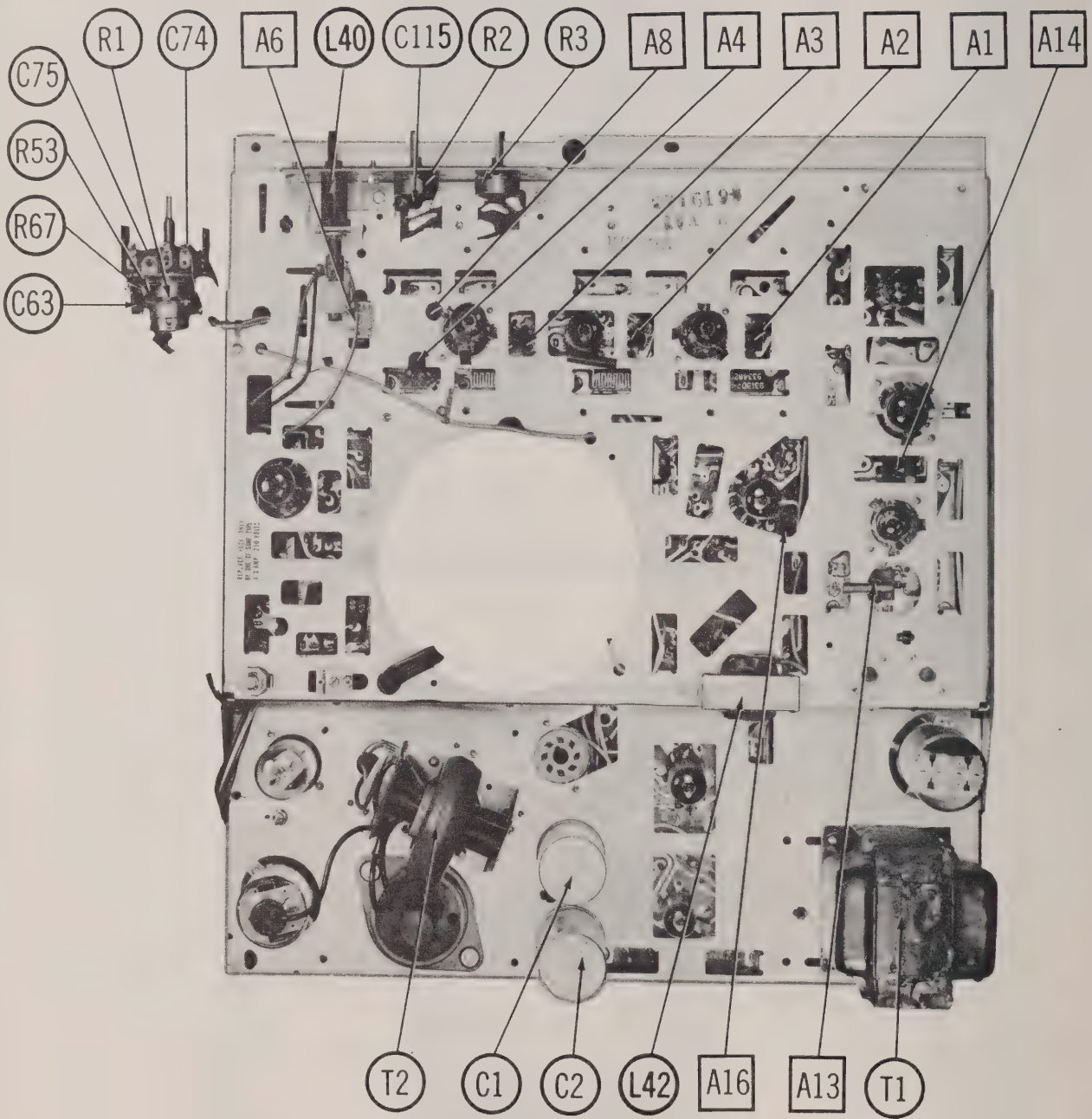
FINE TUNING DRIVE CORD STRINGING



SOUND PRINTED BOARD



VIDEO OUTPUT PRINTED BOARD

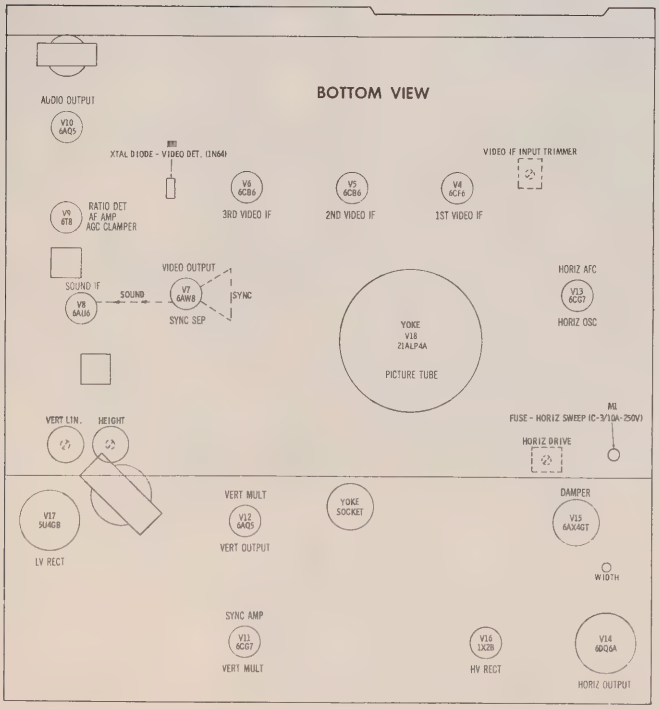


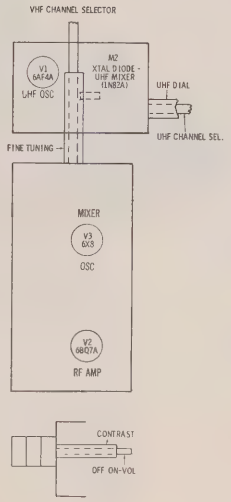
CHASSIS TOP VIEW

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AF4A	*† 22.5K	8200Ω	0Ω	.1Ω	.1Ω	8200Ω	*† 22.5K		
V2	6BQ7A	† 1900Ω	† 480K	† 580K	0Ω	.1Ω	† 580K	200K	120Ω	0Ω
V3	6X8	0Ω	100K	† 12K	.1Ω	0Ω	0Ω	100K	† 16K	† 16K
V4	6CF6	420K	47Ω	0Ω	.1Ω	▲ 680Ω	▲ 680Ω	0Ω		
V5	6CB6	70K	75K	0Ω	.1Ω	† 700Ω	† 700Ω	75K		
V6	6CB6	.1Ω	180Ω	0Ω	.1Ω	† 3800Ω	† 3800Ω	0Ω		
V7	6AW8	0Ω	2.4Meg	† 390K	.1Ω	0Ω	● 150Ω	1Meg	† 56K	† 7000Ω
V8	6AU6	47K	0Ω	0Ω	.1Ω	† 6000Ω	† 6000Ω	82Ω		
V9	6T8	INF	33K	INF	.1Ω	0Ω	200K	0Ω	10Meg	† 330K
V10	6AQ5	470K	470Ω	.1Ω	0Ω	† 2170Ω	† 1850Ω	470K		
V11	6CG7	16K	33K	0Ω	0Ω	.1Ω	†● 1.5Meg	● 2.5Meg	0Ω	0Ω
V12	6AQ5	● 1.6Meg	0Ω	.1Ω	0Ω	† 550Ω	† 200Ω	● 1.6Meg		
V13	6CG7	† 51Ω	1.2Meg	180K	0Ω	.1Ω	† 40K	250K	0Ω	0Ω
V14	6DQ6A	NC	0Ω	NC	† 8200Ω	1Meg	TP	.1Ω	100Ω	TOP CAP ‡ 20Ω
V15	6AX4GT	NC	NC	850K	NC	† 50Ω	NC	0Ω	.1Ω	
V16	1X2B		PINS	1 THRU 9	HAVE	INF	RESISTANCE			TOP CAP ‡ 330Ω
V17	5U4GB	TP	40K	NC	31Ω	TP	34Ω	TP	40K	
V18	21ALP4A	0Ω	22K	PIN 6 † 3300Ω	PIN 10 ‡ 340K	PIN 11 ● 200K	PIN 12 .1Ω			

* MEASURED IN UHF POSITION
▲ MEASURED FROM PIN 2 OF V5
● THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION
‡ MEASURED FROM PIN 3 OF V15
TP TIE POINT
NC NO CONNECTION

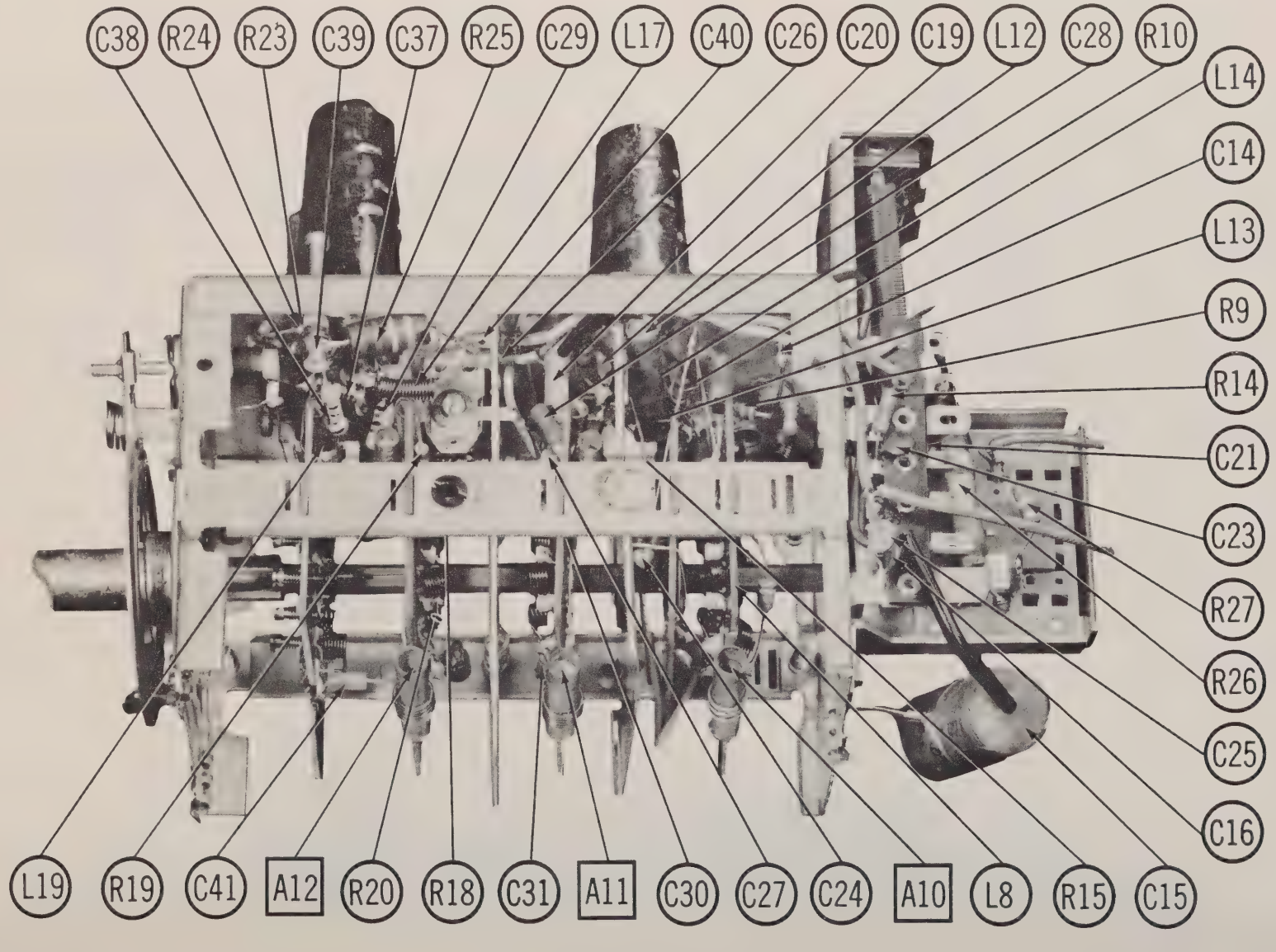




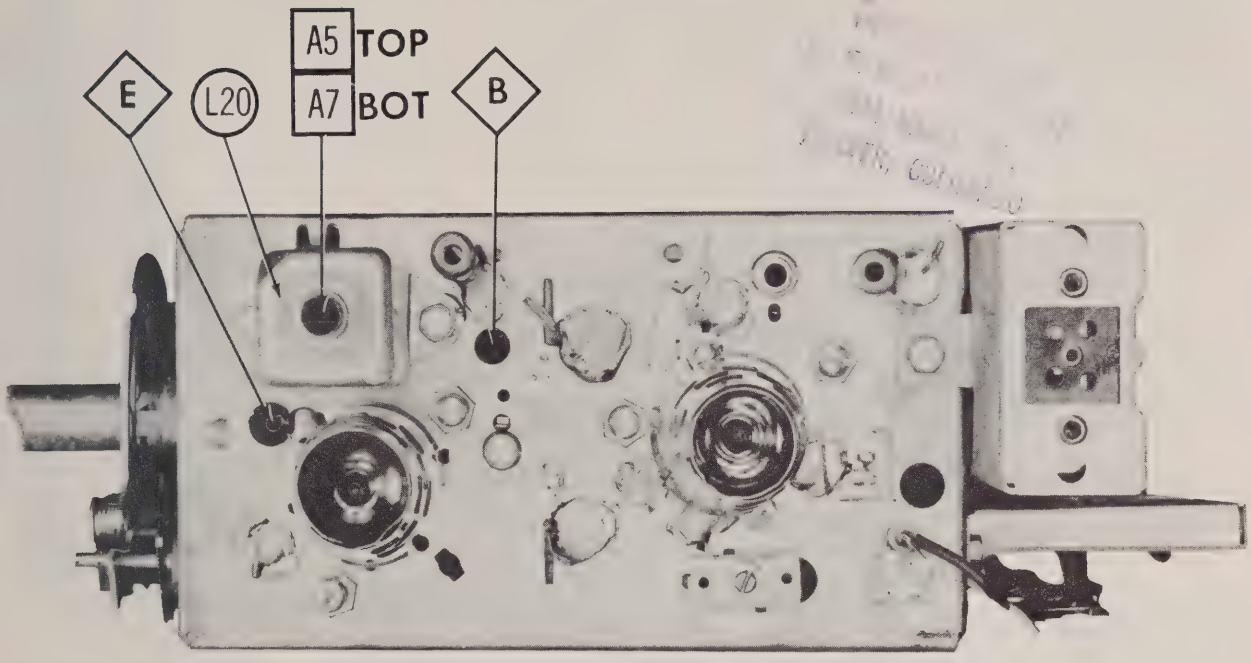
TUBE PLACEMENT CHART

SET 347 FOLDER 14

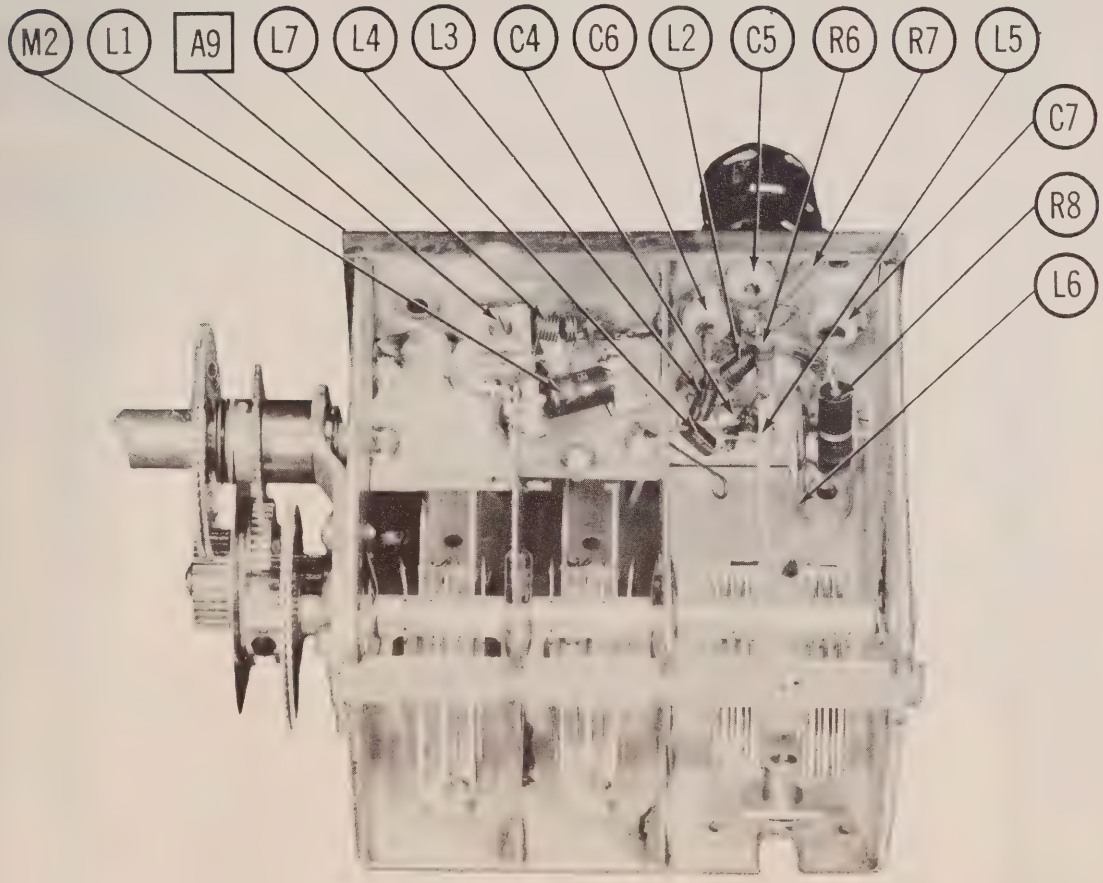
RCA VICTOR MODELS 21-T-7112, U, 21-T-7113, U, 21-T-7117, U, 21-T-7152, U, 21-T-7153, U, 21-T-7157, U, 21-T-7352, U, 21-T-7355, U, 21-T-7357, U (Ch. KCS98A, C, E, F)



VHF TUNER RIGHT SIDE



VHF TUNER TOP VIEW



UHF TUNER

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	UHF Osc-Mixer	6AF4A	
V2	RF Amplifier	6BQ7A	
V3	Mixer-Oscillator	6X8	
V4	1st Video IF Amplifier	6CB6	
V5	2nd Video IF Amplifier	6CB6	
V6	3rd Video IF Amplifier	6L6G	
V7	Video Output Sync Sep	6AW8	
V8	Sound IF Amplifier	6AU6	
V9	Ratio Det - Audio Amplifier - 42 Amplifier	6T8	

ITEM No.	USE	TYPE	NOTES
V10	Audio Output	6AQ5	
V11	Sync. Amp. - Vert. Multi	6U8	
V12	Vert. Multi - Vert. Output	6AQ8	
V13	Horiz. AFC-Horiz. Osc	6CG7	
V14	Horiz. Output	6DQ6A	
V15	Damper	6AX4GT	
V16	HV Rectifier	1X2B	
V17	LV Rectifier	5U4GB	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				
	RCA Victor PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES	
V18	21AUP4A	21AUP4A-1	21AUP4A-2	Aluminized	
		21AUP4B	21AUP4A-3	Silver screen 85	
		21AUP4-1	21AUP4		
		21AUP4-2	21AUP4		

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA					
	CAP	VOLT	RCA Victor PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	120	400	79756	AFH10-20	DCM50	TMS-81	S-285	TVL-1879
C2A	40	450	10240	AFH40-450	FP389	FP389	T-537	R2345 *
B	480	350			TC96		MTD-4510	
C	60	400						
D	20	50						
C3	15	150	78943	PRS30V5	6R550	TC30	TD 5-50	MMT-0505

ITEM No.	REPLACEMENT DATA							NOTES
	RCA Victor PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.		
C4	0-3.5	79656		829-4				
C5	1000	79669		EF-001	MFT-1000			
C6	1000	79669		EF-001	MFT-1000			
C7	1000	79669		EF-001	MFT-1000			
C8	18				TCZ-18	Z2Z2	TCO-18	
C9	5			SI 8	DD-050	DS11	ED-5	
C10	27				TCZ-27	Z2Z7	TCO-27	
C11	33			SI 33	DE-330	DS39	ED-33	
C12	3-3		T1503	MPG-SI 3.3	TCZ-3R3	Z006	TCO-3.3	
C13	270		SI 270	DE-271	G054	ED-270	UC-5327	
C14	1000		ED-001	MFT-1000				
C15	47	200	10180B	P288M-47	CUB2Z47		GEM-3047	
C16	1000		T7753	BPD-001	DD-103	SYA4DA	ED-1000	
C17	4		T6523		SZB-4		CT551	
C18	1000		T7753	BPD-001	DD-103	KD69	ED-1000	
C19	1000		T7753	BPD-001	DD-102	KD69	ED-1000	
C20	3-3		T7751		SZB-3		SI5-3	
C21	10000		T3980	BPD-01	DD-103	KD83	DC81	
C22	1000		T7084	EF-001	MFT-1000			
C23	470		T7823	BPD-0047	DD-471	KD60	ED-470	
C24	270		T7838	SI 270	DE-271	G054	ED-270	
C25	470		T7823	BPD-0047	DD-471	SYA10TX2	ED-470	
C26	1000		T7084	EF-001	MFT-1000			
C27	2-2		T1603	MPG-SI 2.2	TCZ-2R2	Z004	TCO-2.2	
C28	180		T7836	SI 180	DE-181	G048	ED-180	
C29	100			SI 100	DE-101	G043	ED-100	
C30	270		T7836	SI 270	DE-271	G054	ED-270	
C31	2-2		T1603	MPG-SI 2.2	TCZ-2R2	Z004	TCO-2.2	
C32	1000		T7084	EF-001	MFT-1000			
C33	8-3		T7751		SZB-3		SI5-D	
C34	8-3		T7913		SZB-3		SI5-D	
C35	82		T7803	SI 82	DE-820	G040	ED-82	
C36	10			SI 10	DE-100	G018	ED-10	
C37	10		T8347	SI 10	DE-100	G018	ED-10	
C38	10		T7865	SI 10	DE-100	G018	ED-10	
C39	3-3		T1751		SZB-3		SI5-D	
C40	1000		T7084	EF-001	MFT-1000			
C41	68		T1904		TCZ-R68	T2G2	TCO-68	
C42	4700		T3473	BPD-0047	DD-472	KD79	GP-4700	
C43	4700		T3473	BPD-0047	DD-472	KD79	GP-4700	
C44	470		T7823	BPD-0047	DD-471	KD60	ED-470	
C45	470		T8623	BPD-0047	DD-471	KD60	ED-470	
C46	4700		T3473	BPD-0047	DD-472	KD79	GP-4700	
C47	4700		T7823	BPD-0047	DD-472	KD79	GP-4700	
C48	1000		T8623	BPD-001	DD-102	KD69	ED-1000	
C49	1000		T7823	BPD-001	DD-102	KD69	ED-1000	
C50	4700		T3473	BPD-0047	DD-472	KD79	GP-4700	
C51	1000		T8623	BPD-001	DD-102	KD69	ED-1000	
C52	4700		T3473	BPD-0047	DD-472	KD79	GP-4700	
C53	4700		T3473	BPD-0047	DD-472	KD79	GP-4700	
C54								
C55	6		103648			G015		
C56	47	200	10039B	P288M-47		CUB2P47		GEM-3047
C57		400	79251	P488M-1	DF-104	CUB4P1		GEM-401
C58		200	73781	P288M-47		CUB2P47		GEM-3047
C59	25		103855	SI 27	DE-270	G037	ED-27	UC-5427
C60	33	600	10048B	P688M-33		CUB6P33		GEM-6033
C61	47	200	10039B	P288M-47		CUB2P47		GEM-3047
C62	470		T7823	BPD-0047	DD-471	KD60	ED-470	UC-5347
C63	1000	500	10046B	1464-001		1R3DK		MCE255
C64	022	600	73643	P468M-022		CUB4S22		GEM-4122
C65	047	200	73558	P288M-047		CUB2M47		GEM-3047
C66	5		103655	BPD-0.5.3	DS-030		TCO-3R3	Z7-S5
C67	56		103207	SI 56	DE-560	G039	ED-56	UC-5456
C68	270		10264B	SI 2700	DE-273	KD78	GP-2700	UC-5327
C69	470			BPD-0047	DD-471	KD60	ED-470	UC-5347
C70	1000		T3980	BPD-01	DD-103	KD83	GP-10000	DC81
C71	470		T7393	BPD-0047	DD-471	KD60	ED-470	UC-5347
C72	0027	600	10264D	SI 2700	DE-272	KD75	GP-2700	
C73	1000		10233B	BPD-01	DD-103	KD83	GP-10000	UC-5213
C74	01	200	79316	P288M-01		CUB2S1	ED-01	GEM-215
C75	015	200	T7943	P288M-015				GEM-215

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.
C76	01	200	101000	BPD-01	DD-103	CUB2S1	ED-01	GEM-211	2TM-01
C77	1000		102324	BPD-001	DD-103	BYA4DI	ED-1000	DC52	5HK-DI
C78	470		T7393	BPD-0047	DD-471	KD60	ED-470	UC-5347	5GA-T47
C79	01	600	102330	P468M-01	DD-103	CUB4S1		GEM-611	4TM-01
C80	0022	1000	T3803	P698M-0022	DD-223	CUB6D2S		GEM-10322	10TM-D22
C81	027	400	73654	P488M-027	DF-305	CUB4S27		GEM-4127	4TM-S27
C82	01	600	73655	P688M-01	DD-103	G066	ED-330	UC-5333	5GA-T33
C83	330		103858	BPD-0033	DD-331	G066	ED-330	UC-5333	5GA-T33
C84	033	400	73553	P488M-033	DF-305	CUB4S33		GEM-4133	4TM-S33
C85	220		39856	1469-00022					MG-322
C86	01	400	73581	P488M-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1
C87	0022	1000	73558	P698M-0022	DF-303	CUB6D22	GP-1200	GEM-6223	6TM-D22
C88	0047	600	73930	P688M-0047	DD-473	CUB6Z47	GP-4700	GEM-6247	6TM-D47
C89	022	600	73795	P688M-022	DF-303	CUB6S22	ED-02	GEM-6122	6TM-S22
C90	047	600	73853	P688M-047	DD-473	CUB6S47		GEM-6147	6TM-S47
C91	01	400	73581	P488M-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1
C92	068	600	79010	P688M-068		CUB2S68		GEM-2168	2TM-S68
C93	200	200	79630	P288M-015	DD-103	CUB2S15	ED-015	GEM-2115	2TM-S15
C94	0039	400	T8015	P488M-0039	DM-392	CUB4G39	GP-3900	GEM-4139	4TM-G39
C95	027	600	103862	P688M-027	DF-303	CUB6Z27		GEM-6127	6TM-Z27
C96	001	1000	T3849	P698M-001	DD-102	CUB6D1	ED-001	GEM-6101	10TM-D1
C97	92	1000	78474	1469-000082					MG-486
C98	68	1000	78475	1469-000068					MG-468
C99	47	200	10039B	P288M-47		CUB2P47		GEM-3047	
C100	1	400	T3851	P488M-1	DF-104	CUB4P1		GEM-401	4TM-P1
C101	022	400	T3933	P488M-022	DF-303	CUB4S22	ED-02	GEM-4122	4TM-S22
C102	330	1000	T6478	1469-00033					MG-333
C103	01	600	73594	P688M-01	DD-103	CUB6S1	GP-10000	GEM-611	6TM-S1
C104	470	1000	53957	1469-00047					MG-347
C105	1	800	73657	P898M-1	DF-104	CUB9P1		GEM-901	6TM-P1
C106	27	200	T3795	P288M-27		CUB2P27		GEM-2027	2TM-P27
C107	0012	600	76986	P688M-0012	DS-122	CUB6D12	GP-1200	GEM-6123	6TM-D12
C108	270	1000	78579	1469-00037					MG-327
C109	047	1000	73597	P10B8M-047	DF-503	CUB10S47		GEM-10147	10TM-S47
C110	1	400	T3851	P488M-1	DF-104	CUB4P1		GEM-401	4TM-P1
C111	1	400	T3851	P488M-1	DF-104	CUB4P1		GEM-401	4TM-P1
C112	50		100453	SI 150	DE-151	G046	ED-150	UC-5315	5GA-T15
C113	150		100453	SI 150	DE-151	G046	ED-150	UC-5315	5GA-T15
C114	150			SI 150	DE-151	G046	ED-150	UC-5315	5GA-T15
C115	1000		T8623	BPD-001	DD-102	KD69	ED-1000	DC52	5HK-DI

Note 1. Part of 329MC trap coil (L11).
Note 2. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	100293				UR-4196	Contrast - Tap @ 2.5K
B	1Meg	½						Volume - Tap @ 350K
C	Switch						Not Reg.	Attach to R1B
R2A	300 K	½	103409	B-45	A47-300K-B	QU-139	U43	Brightness
B	Shaft			Not Reg.	FS-3	Not Reg.	Not Reg.	Attach to R2A
R3A	1.5Meg	½	103410	AB-743	A47-1.5Meg-B	QU-138	U105	Vert. Hold
B	Shaft							
R4A	1.5Meg	½	103408	AK-5	FS-3	Not Reg.	Not Reg.	Attach to R3A
B				BX-742	A47-1.5Meg-B	BU-136	TA155L	Vert. Linearity
R5	Shaft			Not Reg.	FKH-1/8	TM3-KH	Not Reg.	Attach to R4A
R5A	3Meg	½	100390	AB-87	A47-3Meg-B	QU-141	SU-67	Height
B	Shaft			AK-19	FC-3	TFQ	Not Reg.	Attach to R5A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R6	560Ω			BTS-5600	Note 1
R7	2700Ω			BTS-2700	Note 2
R8	6800Ω	1	512388	BTA-6800	
R9	5600Ω		502266	BTS-5600	
R10	100K		502410	BTS-100K	
R11	1Meg		502511	BTS-1Meg	
R12	1Meg		502510	BTS-1Meg	
R13	680Ω		502250	BTS-680	
R14	820Ω		502251	BTS-820	
R15	1000Ω		502210	BTS-1000	
R16	1000Ω		502210	BTS-1000	
R17	100K		502410	BTS-100K	
R18	100K		502410	BTS-100K	
R19	680Ω		502268	BTS-680	
R20	3300Ω		502323	BTS-3300	
R21	27K 5%		503327	BTS-27K 5%	
R22	15K	2	532315	BTS-15K	
R23	130Ω		502131	BTS-130	
R24	100K		502410	BTS-100K	
R25	12K	2	532312	BTS-12K	
R26	18K	2	532318	BTS-18K	
R27	470K		502447	BTS-470K	
R28	3300Ω		502333	BTS-3300	
R29	2200Ω		502322	BTS-2200	
R30	47K 5%		503247		
R31	47K 5%		503247		
R32	680Ω		502268	BTS-680	
R33	18K		502318	BTS-18K	
R34	100K		502410	BTS-100K	
R35	470 5%		503247	BTS-47 5%	
R36	150K 5%		502425	BTS-150K 5%	
R37	680Ω		502268	BTS-680	
R38	150K 5%		502425	BTS-150K 5%	
R39	4700		502247	BTS-470	
R40	1800 5%		502318	BTS-180 5%	
R41	39000 5%		502339	BTS-3900	
R42	2200		502422	BTS-2200	
R43	82K		502323	BTS-82K	
R44	390Ω		502139	BTS-390	
R45	820K		502483	BTS-820K	
R46	68K	2	532368	BTS-68K	
R47	680K		502468	BTS-680K	
R48	1Meg		502510	BTS-1Meg	
R49	330Ω		502133	BTS-330	
R50	56K	1	512356	BTA-56K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R51	330Ω			BTS-2200	
R52	33K			BTS-33K	
R53	3300Ω			BTS-3300	
R54	6800Ω	2		BTS-6800	
R55	150K			BTS-150K	
R56	27K			BTS-27K	
R57	560K			BTS-560K	
R58	1.2Meg			BTS-1.2Meg	
R59	2.2Meg			BTS-2.2Meg	
R60	270K			BTS-270K	
R61	390K			BTS-390K	
R62	47K			BTS-47K	
R63	2700Ω			BTS-2700	
R64	82Ω			BTS-82	
R65	39K			BTS-39K	
R66	33K 5%			BTS-33K 5%	
R67	39K			BTS-39K	
R68	10Meg			BTS-10Meg	
R69	330K			BTS-330K	
R70	2000Ω			BTS-2000	
R71	1.2Ω			BW1-1.2	
R72	470K		503447	BTS-470K	
R73	470Ω	1	512147	BTA-470	
R74	18000Ω	2	532318	BTS-1800	
R75	560K		503456	BTS-560K	
R76	33K		503333	BTS-33K	
R77	10K	1	513310	BTA-10K	
R78	33000 5%		503323	BTS-3300 5%	
R79	33K		503323	BTS-33K	
R80	820K		503482	BTS-820K	
R81	6.8Meg		503568	BTS-6.8Meg	
R82	1Meg		503510	BTS-1Meg	
R83	18K		502318	BTS-18K	
R84	33K		503333	BTS-33K	
R85	18K 5%		502318	BTS-18K 5%	
R86	15K		502315	BTS-15K	
R87	5600		502265	BTS-5600	
R88	470K		503447	BTS-470K	
R89	470K		503447	BTS-470K	
R90	22K 5%	1	513222	BTA-22K 5%	
R91	1500	1	513215	BTA-1500	
R92	1Meg		502510	BTS-1Meg	
R93	33K		503323	BTS-33K	
R94	560Ω				

RESISTORS (cont)

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R95	560Ω				
R96	330K		503422	BTS-330K	
R97	330K		503435	BTS-330K	
R98	820K		503483		
R99	100K 5%		502410	BTS-100K 5%	
R100	82K 5%		502323	BTS-82K 5%	
R101	3900Ω		502239		
R102	150K 5%	1	513415	BTA-150K 5%	
R103	6.8Meg		503568		
R104	47K		503347	BTS-47K	
R105	39K	1	513339		
R106	820K		503482		

Note 1. In some versions a 4700Ω is used. Replace with value found in unit.
Note 2. In some versions a 3300Ω is used. Replace with value found in unit.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R107	1Meg		503510		
R108	470		503247		
R109	63000	2	532363	BTS-63000	
R110	100Ω	5	74018	BW2-100	
R111	68K		503368	BTS-68K	
R112	470K		503457	BTS-470K	
R113	470K		503447	BTS-470K	
R114	1.8Ω		100305	BW1-1.8	
R115	100KΩ		503410	BTS-100K	
R116	47000		503347	BTS-4700	
R117	33000	7	103467	2W7-3300	
R118	100K		503410	BTS-100K	

Note 1. In some versions a 4700Ω is used. Replace with value found in unit.
Note 2. In some versions a 3300Ω is used. Replace with value found in unit.

TRANSFORMER (POWER)

ITEM No.	REPLACEMENT DATA								
	PRI.	SEC. 1	SEC. 2	SEC. 3	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @1.52A	550VCT @ 240A	6.3V @3A	5V @6.1A	103406					

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		RCA Victor PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Horiz. Output Trans.	100336	FB49P *1	HVO-36 *2		KO94 ① *5	HO34 ② *6	FLY-16 *3	D-66 ① *6
T3	Vert. Output Trans.	102407	Z1900 ③ ⑤	A-3823 ③		V30 ③ ⑤	A-8148 ③ ⑤	366*2 ⑤	A-108X ③
T4A	Yoke (90°) Horiz. (LB. 5MH) Vert. (38MH)	100886 ⑤	DF907 ⑤ ⑬	MDP-92 ⑬ ⑭		Y90P19/43 ⑤ ⑬ ⑭	DY-32A ⑤ ⑬	Y-16 ⑤ ⑬	Y-44-1 ⑤ ⑬
T5	Width Coil	79144	RF800 ⑤ ⑭	MWC-11		30UR16	WC-8	WC-16 ⑬	WC-13 ⑬

① Drill new mounting hole(s).
② Connect as auto transformers.
③ Use 7 to 1 turns ratio.
④ Cut and tape green lead.
⑤ Includes yoke plug, capacitor C114, resistors R94 and R95. Does not include yoke rear cover, and centering device (RCA part #602295).
⑥ If necessary, use original horizontal yoke damping network with capacitor C114 across horizontal yoke terminals #3 and #7.
⑦ Connect horizontal yoke terminal #3 to yoke plug pin #4, horizontal yoke terminals #2 and #7 to yoke plug pin #9, horizontal yoke terminal #1 to yoke plug pin #8.
⑧ Use original yoke rear cover and centering device.
⑨ Enlarge mounting hole.
⑩ Use terminals #1 and #2.
⑪ Use red and blue terminals.
⑫ This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Rem Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	5	9	9		8	9	9	9
	4	7	7		7	7	7	7
	3	5	5		5	5	5	5
	2	3	3		3	3	3	3
	1	1	1		1	1	1	1
Connect Width Coil Across		3 & 1	3 & 1	3 & 1	3 & 1	3 & 1	3 & 1	3 & 1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T9	7.5K	3-4Ω	102837 ①	Z113	A-3831	A-3878	24S53	S-7X
	7.6K	3-4Ω	100937 ②	Z100X	A-3020	A-3878 ③	26S48	S-9Z

① Used in Ch. KC598A, C.
② Used in Ch. KC598E, F.
③ Drill one new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	77000 ①	5A07	① Used in Models 21T7152, U; 21T7153, U; 21T7352, U.
	6"	PM	3-4Ω	79696 ②	6A07	② Used in Models 21T7113, U; 21T7115, U; 21T7117, U.
	6" x 9"	PM	3-4Ω	101182 ③		③ Used in Models 21T7352, U; 21T7355, U; 21T7357, U.

COILS (RF-IF)

ITEM No.	USE	RCA Victor PART No.	NOTES
L1	UHF Ant Coil	79564	
L2	Fil. Choke	79565	
L3	Fil. Choke	79565	
L4	Cath. Choke	79565	
L5	UHF Osc. Coil	79557	Includes Cap. C4
L6	UHF Osc. Coil	79566	
L7	UHF IF Output	79567	.15 Microhenry Stator assy. complete with rotor and C13
L8	VHF Ant. Coils	78396	Channel 13
L9	VHF Ant. Coil	78401	
L10	RF Choke	103845	
L11	UHF IF Coil	79542	

ITEM No.	USE	RCA Victor PART No.	NOTES
L15	VHF RF Coils	79274	Stator assy complete with rotor includes C27, C28, C3 & R13
L16	VHF Mixer Grid	78273	Stator assy. complete with rotor includes# C29, C30, C6, R14, R15, R16, R17
L17	Fil. Choke	78783	
L18	VHF Osc. Coils	79068	Stator assy. complete with rotor includes C34, Channel 13 includes 47.25MC
L19	VHF Osc. Coil	77859	
L20	Conv. Plate	102446	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.
C116	01	200	101000	BPD-01	DD-103	CUB2S1	ED-01	GEM-211	2TM-01
C117	1000		102324	BPD-001	DD-103	BYA4DI	ED-1000	DC52	5HK-DI
C118	470		T7393	BPD-0047	DD-471	KD60	ED-470	UC-5347	5GA-T47
C119	01	600	102330	P468M-01	DD-103	CUB4S1		GEM-611	4TM-01
C120	0022	1000	T3803	P698M-0022	DD-223	CUB6D2S		GEM-10322	10TM-D22
C121	027	400	73654	P488M-027	DF-305	CUB4S27		GEM-4127	4TM-S27
C122	01	600	73655	P688M-01	DD-103	G066	ED-330	UC-5333	5GA-T33
C123	330		103858	BPD-0033	DD-331	G066	ED-330	UC-5333	5GA-T33
C124	033	400	73553	P488M-033	DF-305	CUB4S33		GEM-4133	4TM-S33
C125	220		39856	1469-00022					MG-322
C126	01	400	73581	P488M-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1
C127	0022	1000	73558	P698M-0022	DF-303	CUB6D22	GP-1200	GEM-6223	6TM-D22
C128	0047	600	73930	P688M-0047	DD-473	CUB6Z47	GP-4700	GEM-6247	6TM-D47
C129	022	600	73795	P688M-022	DF-303	CUB6S22	ED-02	GEM-6122	6TM-S22
C130	047	600	73853	P688M-047	DD-473	CUB6S47		GEM-6147	6TM-S47
C131	01	400	73581	P488M-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1
C132	068	600	79010	P688M-068		CUB2S68		GEM-2168	2TM-S68
C133	200	200	79630	P288M-015	DD-103	CUB2S15	ED-015	GEM-2115	2TM-S15
C134	0039	400	T8015	P488M-0039	DM-392	CUB4G39	GP-3900	GEM-4139	4TM-G39
C135	027	600	103862	P688M-027	DF-303	CUB6Z27		GEM-6127	6TM-Z27
C136	001	1000	T3849	P698M-001	DD-102	CUB6D1	ED-001	GEM-6101	10TM-D1
C137	92	1000	78474	1469-000082					MG-486
C138	68	1000	78475	1469-000068					MG-468
C139	47	200	10039B	P288M-47		CUB2P47		GEM-3047	
C140	1	400	T3851	P488M-1	DF-104	CUB4P1		GEM-401	4TM-P1
C141	022	400	T3933	P488M-022	DF-303	CUB4S22	ED-02	GEM-4122	4TM-S22
C142	330	1000	T6478	1469-00033					MG-333
C143	01	600	73594	P688M-01	DD-103	CUB6S1	GP-10000	GEM-611	6TM-S1
C144	470	1000	53957	1469-00047					MG-347
C145	1	800	73657	P898M-1	DF-104	CUB9P1		GEM-901	6TM-P1
C146	27	200	T3795	P288M-27		CUB2P27		GEM-2027	2TM-P27
C147	0012	600	76986	P688M-0012	DS-122	CUB6D12	GP-1200	GEM-6123	6TM-D12
C148	270	1000	78579	1469-00037					MG-327
C149	047	1000	73597	P10B8M-047	DF-503	CUB10S47		GEM-10147	10TM-S47
C150	1	400	T3851	P488M-1	DF-104	CUB4P1		GEM-401	4TM-P1
C151	1	400	T3851	P488M-1	DF-104	CUB4P1		GEM-401	4

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	RCA Victor PART No.	NOTES
L12	Fil. Choke	77206	
L13	Neut. Coil	76562	
L14	RF Choke	78466	

ITEM No.	USE	RCA Victor PART No.	NOTES
L21	Trap Coil	102846	trap 235MC includes Cap. C10

ITEM No.	USE	REPLACEMENT DATA				NOTES
		RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L22	RF Choke	102651				Note 1
L23	47.25MC Trap	102650				
L24	1st. Video IF	102649				
L25	Fil. Choke					
L26	2nd. Video IF	102652				
L27	Fil. Choke					
L28	3rd. Video IF	102652				
L29	4th. Video IF	102652				
L30	Series Peaking Coil	102639			6152	18 Microhenries
L31	Series Peaking Coil	102639			6152	18 Microhenries
L32	Shunt Peaking Coil	100360	19-3300		6155	300 Microhenries
L33	4.5MC Trap	100358				
L34	Series Peaking Coil	100361	19-3300 *		6155 *	300 Microhenries wound on 6800Ω resistor
L35	Series Peaking Coil	100362	19-3500		6174	510 Microhenries
L36	Shunt Peaking Coil	100363 102645	19-3500 ■		6174 ■	510 Microhenries, wound on 1800Ω resistor
L37	Sound IF	102645				
L38	Ratio Det.	102644				Tertiary winding -.3Ω
L39	RF Choke	102083	19-1001		4604	1.5 Microhenries, (IRC part #CL-1)

* Parallel with 6800Ω resistor.
■ Parallel with 1800Ω resistor.
Note 1. May be a part of printed circuit board.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L40	88Ω		79966							Tapped @ 63Ω Horiz. Freq.
L41	47Ω		100300							Horiz. Waveform

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L42	.240A	51Ω	1.1 HY	102638	C5037 ①	C-2994	C-2326 ①	26C44 ①	C-23X ①

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			RCA Victor PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	C	3/10A	102164	102162	332.300 (C 3/10A)	346001	C 3/10	HC 0 to 3/10

CRYSTAL DIODES

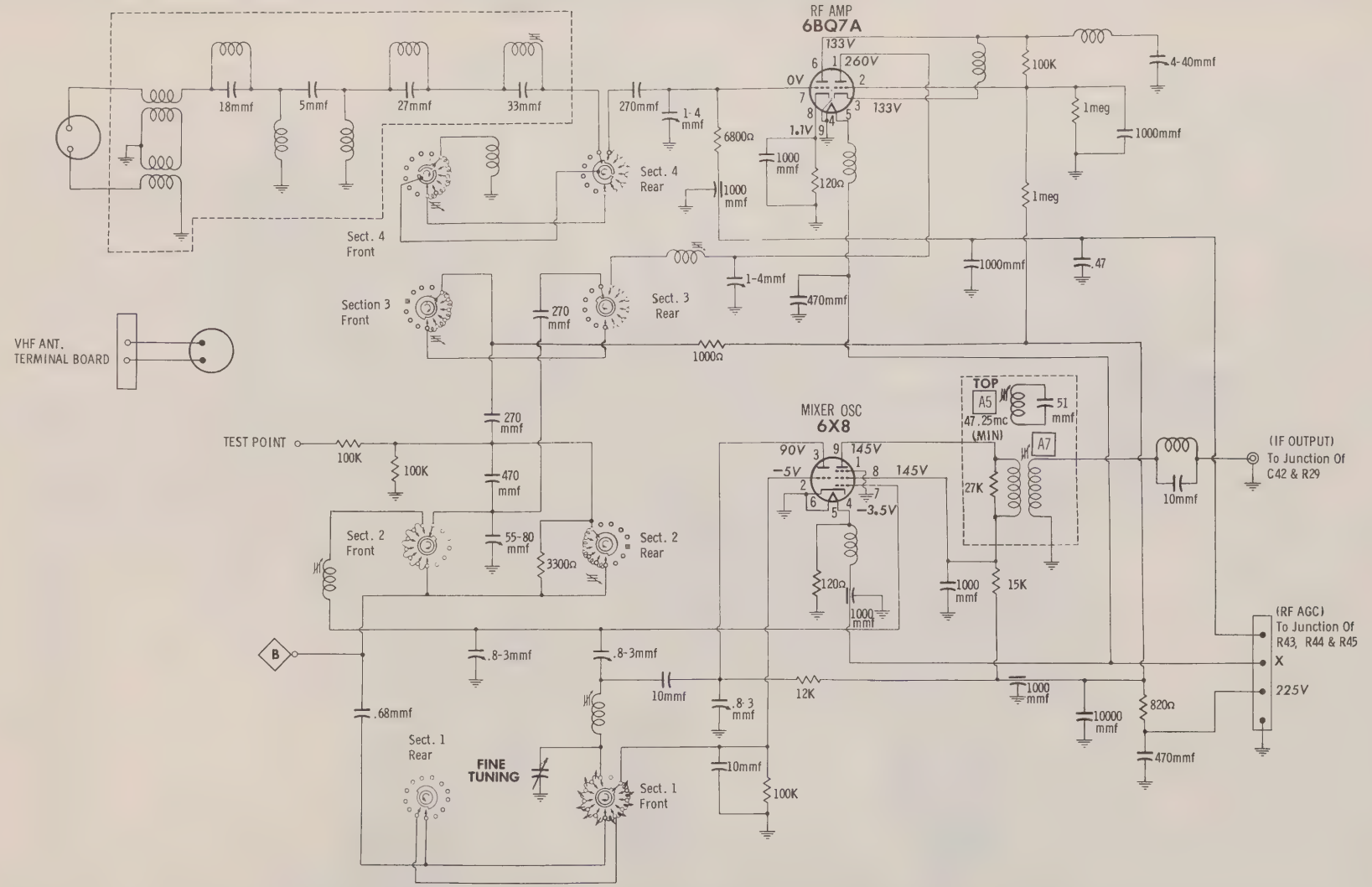
ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		RCA Victor PART No.	SYLVANIA PART No.	
M2	1N82A ①	77489	1N82A	UHF Mixer (Pigtail)
M3	1N64	79985	1N60	Video Detector (Pigtail)

① K3D may be used in some versions.

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M4	Tuner	KRK-29-R	VHF, Used in Chassis KCS98C and KCS98F
	Tuner	KRK22-L	VHF, Used in Chassis KCS98A and KCS98E
M5	Tuner	KRK-36	UHF, Used in Chassis KCS98C and KCS98F
M6	Ant. Matching Assy.	100454	Includes coils, C8, C9, C10 and C11
M7	Switch	102844	UHF/VHF Ant. Selector (Slide type)
M8	Centering Device	102395	
M9	Ion Trap	76141	
	Trimmer Cap.	100849	IF Link (10-160MMF)
	Trimmer Cap.	102412	Horiz. Drive (10-160MMF)
	Trimmer Cap.	78397	VHF Mixer (80-135MMF)
	Printed Board	102387	Sound, less tubes
	Printed Board	102386	Video IF, less tubes
	Printed Board	102388	Video , less tubes
	Printed Board	102390	Vertical, less tubes
	Printed Board	102389	Horizontal, less tubes
	Safety Glass	100959	Models 21T7112, 21T7112U, 21T7113, 21T7113U, 21T7117, 21T7117U, 21T7352, 21T7352U, 21T7355, 21T7355U, 21T7357, 21T7359U
	Safety Glass	102371	Models 21T7152, 21T7152U, 21T7153, 21T7153U, 21T7157, 21T7157U

VHF TUNER LEFT SIDE



CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 2 POSITION

VHF TUNER KRK-22L, AND KRK-52B ---Used with Chassis KCS98A,&E

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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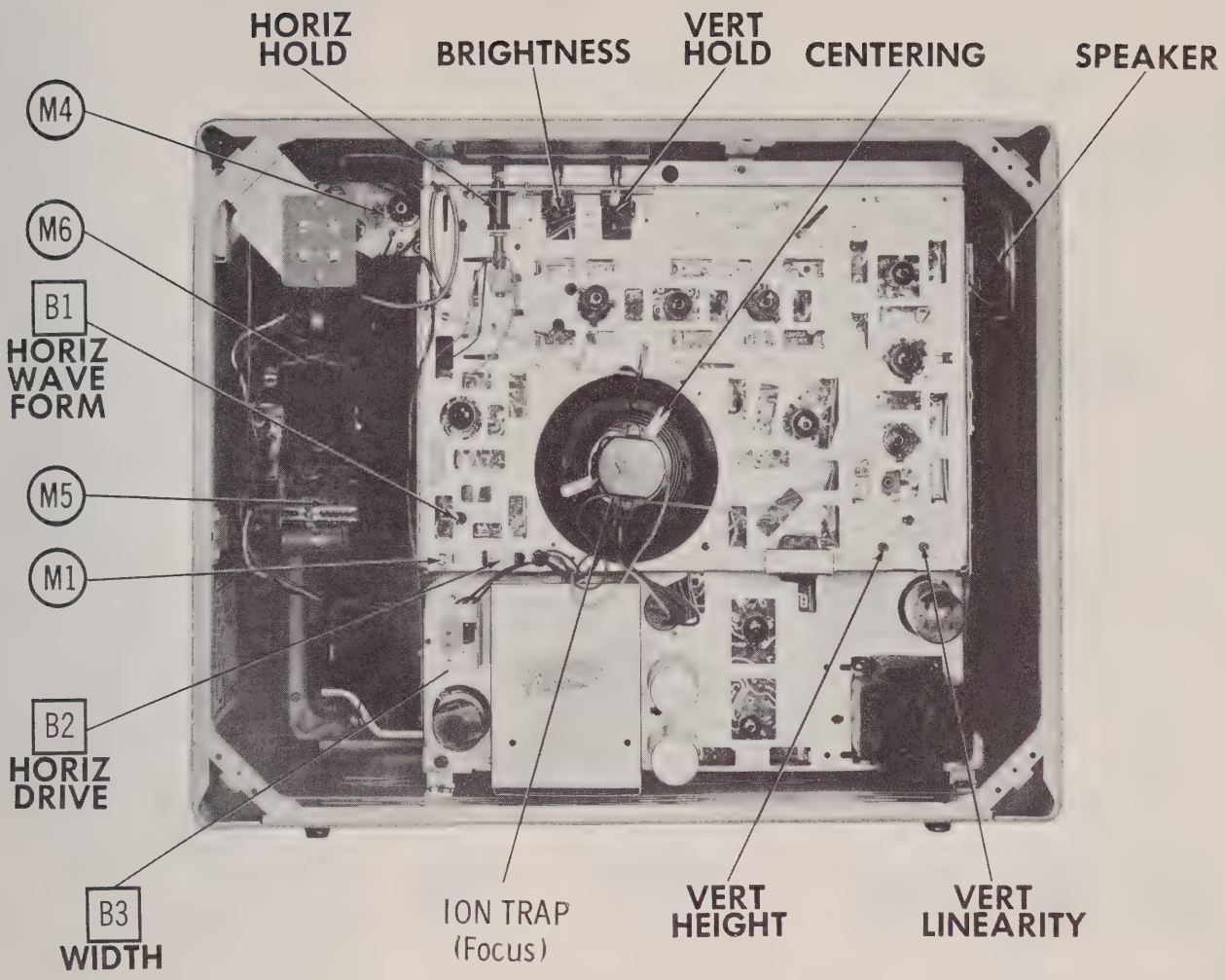
ALTERNATE VHF TUNER SCHEMATIC



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect a clip lead across the horizontal waveform coil (L41) and adjust the horizontal hold until the picture synchronizes horizontally. Remove the clip lead from across L41. Connect the low capacity probe of the oscilloscope to point ◇J◇ and the low side to chassis. Turn the horizontal hold clockwise until the picture falls out of sync, then counter clockwise until the picture just falls into sync. Adjust the horizontal waveform slug (B1) until the waveform on the scope appears similar to that shown in Fig. 7 with equal peaks. If necessary during alignment, keep the picture in sync with the horizontal hold. Remove the scope connections.

Set the width slug (B3) fully counter clockwise. Adjust the horizontal drive trimmer (B2) counter clockwise until a bright vertical line appears in the picture, then turn clockwise until the vertical line just disappears.

Adjust the width slug (B3) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.

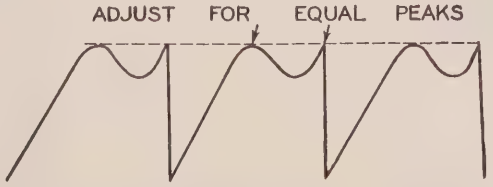


FIG. 7

ROLAND
MODEL 6TR

ROLAND
MODEL 6TR

TRADE NAME	Roland Model 6TR
MANUFACTURER	Roland Radio Corp., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	9 Volts DC RATING 11MA @ 9 Volts DC
TUNING RANGE—BROADCAST	540KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.5MFD	High side to base of GT760 (X1). Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output.
2.	"	"	1620KC	"	"	A4	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

ROLAND
MODEL 6TR

TRANSISTORS

ITEM No.	USE	TYPE	NOTES
X1	Converter	GT760	
X2	1st. IF Amplifier	GT761	
X3	2nd. IF Amplifier	GT760	
X4	AF Amplifier	GT20	
X5	Output	GT20	
X6	Output	GT20	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ROLAND PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	10	10		SRE25V10	BBR10-25	TAP25-10	TD-10-25	MMT-0210	TE-1114
C2	2	25		SRE50V2	BBR2-50	TAP100-2	ML2-25		TVA-1201
C3	10	5		SRE25V10	BBR10-25	TAP25-10	TD-10-25	MMT-0210	TE-1087
C4	100	12		SRE12V100	BRH121		TD-100-15		TVA-1130

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ROLAND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C6	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	Note 1
C7	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C8A	10000		}	BPD-2X01	DD3-103	DK082	ED-01	DC511	5HK-2S1	Note 2
B	10000		}			{	ED-01	DC511	}	Note 2
C9	4.7			NP0-SI 4.7	TCZ-4R7	TZ07	TCO-4.7	ZT-5547	5TCCB-V47	
C10	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C11	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C12	4.7			NP0-SI 4.7	TCZ-4R7	TZ07	TCO-4.7	ZT-5547	5TCCB-V47	
C13	20000			BPD-02	DD-203	K085	ED-02		5HK-S2	
C14	2000			BPD-002	DD-202	K072	ED-002	DC522	5HK-D2	
C15	.047	200		BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	

Note 1. Some versions may use 20000MMF in this application.
Note 2. Some versions may use single units in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ROLAND PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	½	36-8008					Volume & Switch

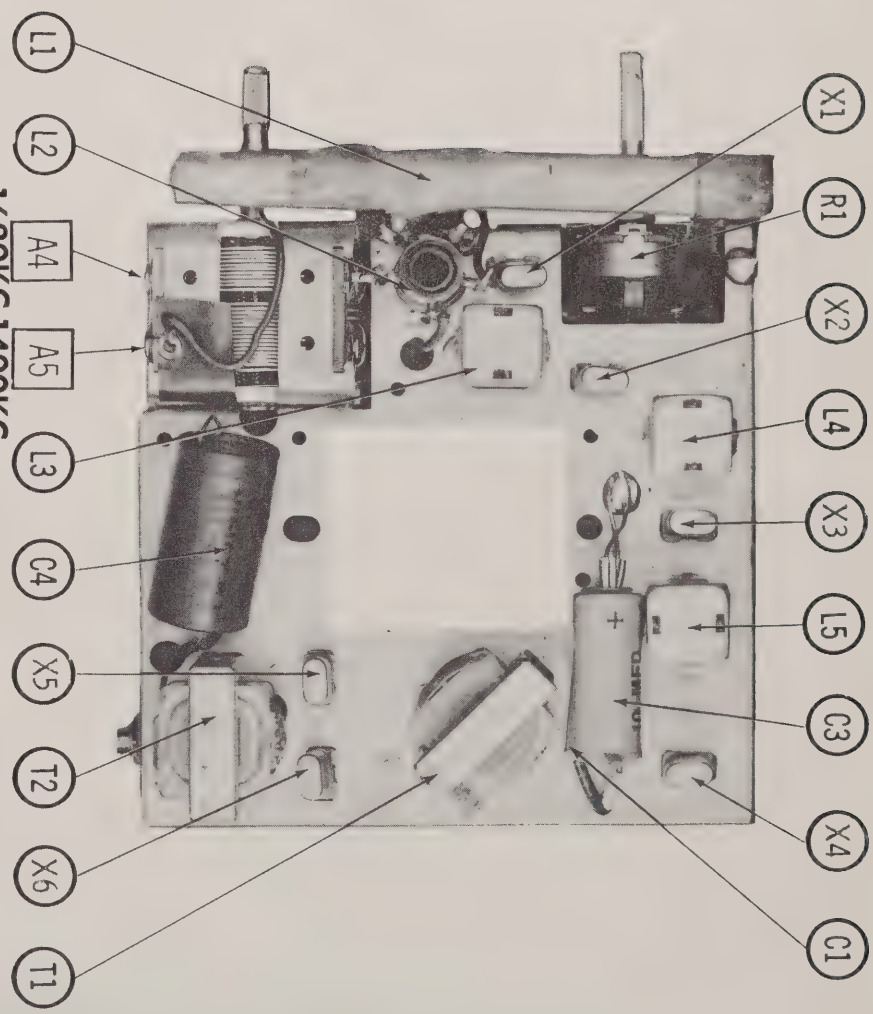
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ROLAND PART No.	IRC PART No.	
R2	18K			BTR-18K	
R3	33K 5%			BTR-33K 5%	
R4	3900Ω			BTS-3900	
R5	15Ω			BTS-15	
R6	2200Ω			BTS-2200	
R7	330Ω			BTS-330	
R8	4700Ω 5%			BTS-4700 5%	
R9	47K 5%			BTR-47K 5%	
R10	33K 5%			BTR-33K 5%	
R11	2200Ω			BTR-2200	
R12	2200Ω			BTS-2200	
R13	100K			BTS-100K	
R14	3300Ω			BTR-3300	
R15	6800Ω			BTR-6800	
R16	10Ω			BTR-10	Note 1
R17	33K 5%			BTR-33K 5%	
R18	1000Ω 5%			BTR-1000 5%	
R19	39K			BTS-39K	
R20	4700Ω 5%			BTS-4700 5%	
R21	100Ω			BTS-100	
R22	12Ω			BTR-12	

Note 1. Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO INPUT)

ITEM No.	Resistance PRI.	Resistance SEC.	REPLACEMENT DATA ROLAND PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2550Ω	190Ω CT	430270				TR-9		
	Turns Ratio $2\frac{1}{2}$: 1								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ROLAND PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	740Ω	3-4Ω	430280				TR-29		

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ROLAND PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω		4A07①	①Fabricate mounting.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA ROLAND PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Stick	LPFE25				
L2	Osc. Coil					
L3	1st. IF Trans.	450018	16-9003		2041	
L4	2nd. IF Trans.	450018	16-9003		2041	
L5	3rd. IF Trans.	450019	16-9002		2042	

BATTERIES

ITEM No.	VOLTAGE	ROLAND PART No.	REPLACEMENT DATA EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	BURGESS "A"	BURGESS "B"	BURGESS "A-B"	INSTALLATION NOTES
M1	$1\frac{1}{2}$V"A"		915			Z			Connect 6 in series

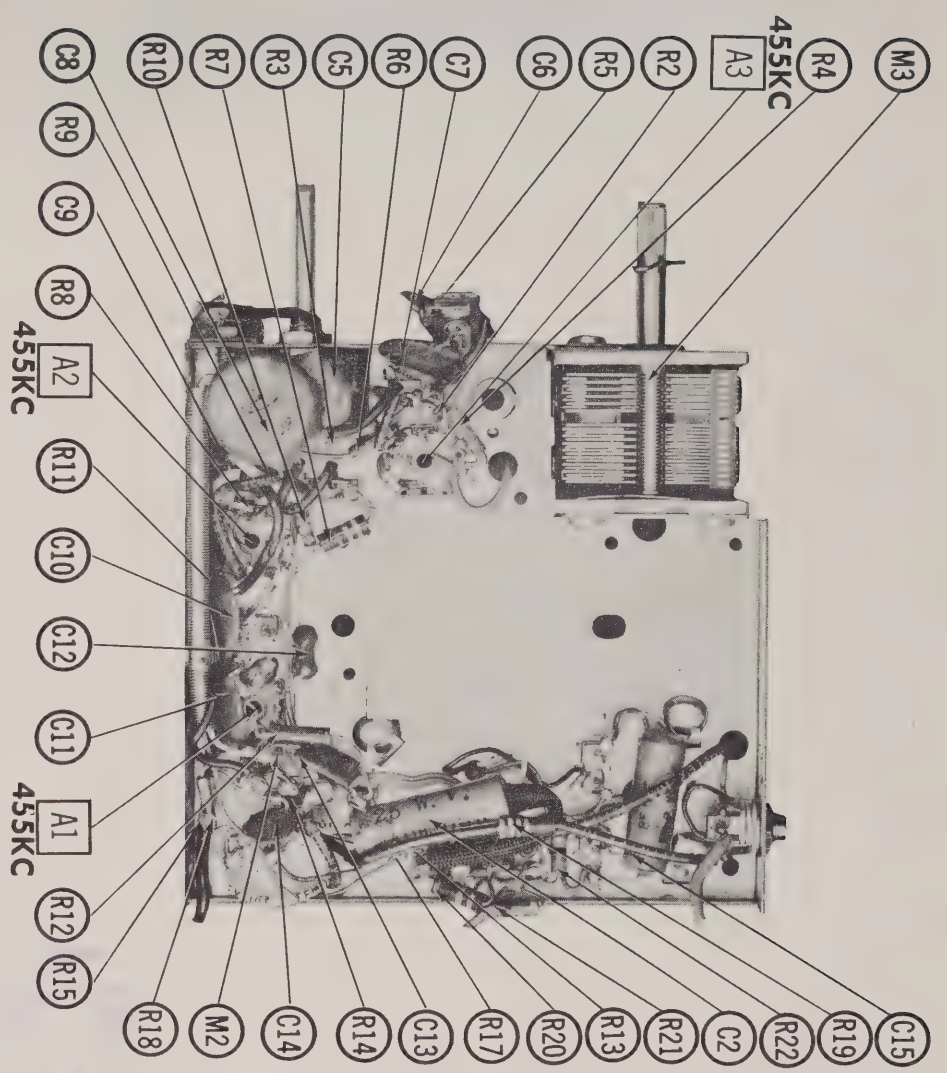
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA ROLAND PART No.	SYLVANIA PART No.	NOTES
M2	1N60		1N60	Pigtail (Audio Det.)

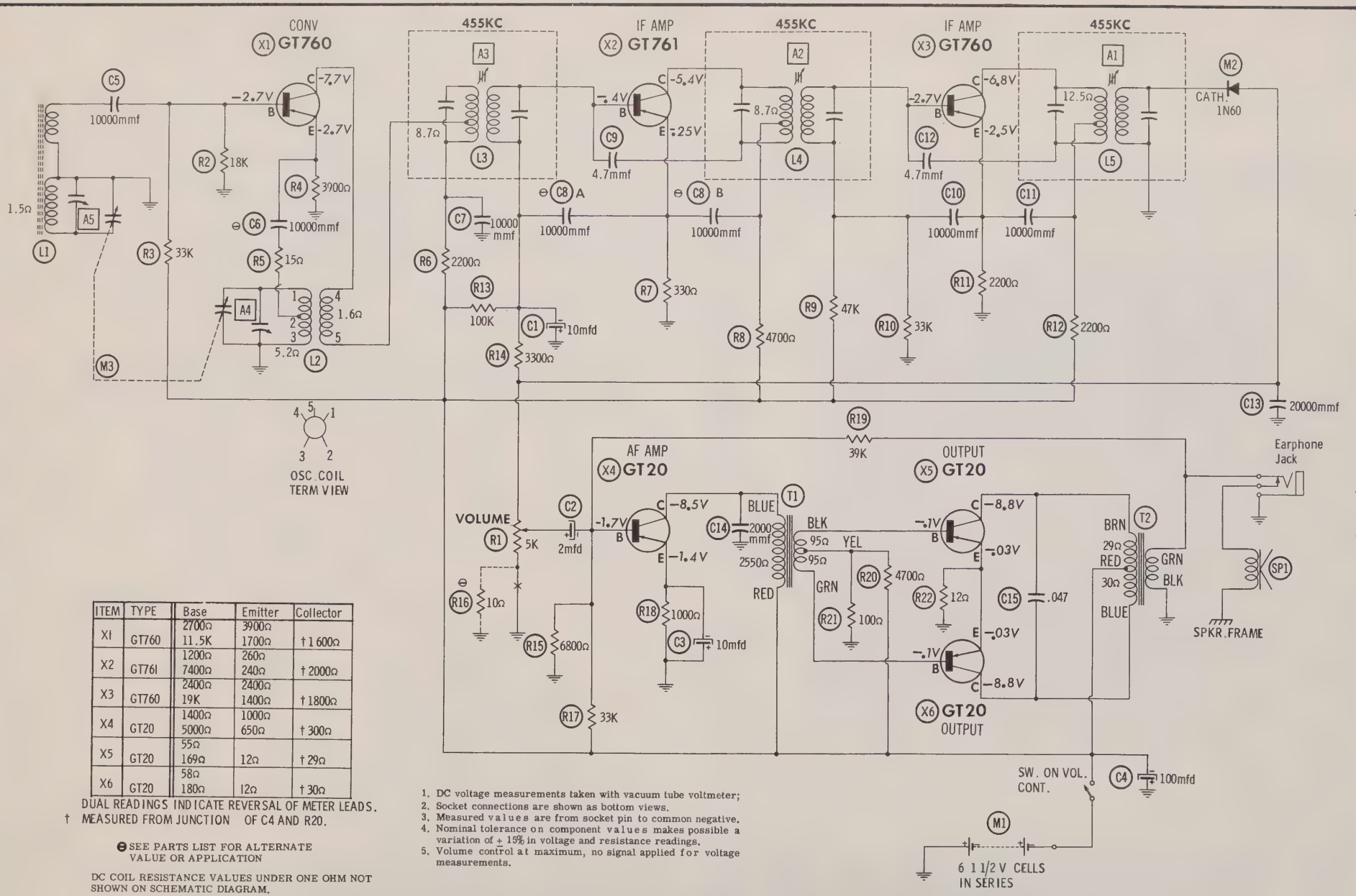
MISCELLANEOUS

ITEM No.	PART NAME	ROLAND PART No.	NOTES
M3	Tuning Cap.	CV78	2 Gang (20-220MMF, 20-120MMF)

CHASSIS—BOTTOM VIEW



ROLAND MODEL 6TR



ITEM	TYPE	Base	Emitter	Collector
X1	GT760	2700Ω 11.5K	3900Ω 1700Ω	†1600Ω
X2	GT761	1200Ω 7400Ω	260Ω 240Ω	†2000Ω
X3	GT760	2400Ω 19K	2400Ω 1400Ω	†1800Ω
X4	GT20	1400Ω 5000Ω	1000Ω 650Ω	†300Ω
X5	GT20	55Ω 169Ω	12Ω	†29Ω
X6	GT20	58Ω 180Ω	12Ω	†30Ω

DUAL READINGS INDICATE REVERSAL OF METER LEADS.
† MEASURED FROM JUNCTION OF C4 AND R20.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

1. DC voltage measurements taken with vacuum tube voltmeter;
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SILVERTONE MODELS
7013, 7014 (Ch. 132.40100)

SILVERTONE MODELS
7013, 7014 (Ch. 132.40100)

TRADE NAME	Silvertone Models 7013, 7014 (Ch. 132.40100)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan, Chicago, Illinois
TYPE SET	AC-DC Operated AM Receiver
TUBES (Six)	Types 6BJ6 RF Amplifier, 12BE6 Converter, 6BJ6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC RATING .31 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC-1630KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver in in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1630KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	Tune to 1400KC signal	"	A6, A7	"
4.		"	600KC	Tune to 600KC signal	"	A8, A9	Adjust for maximum output while rocking tuning gang.

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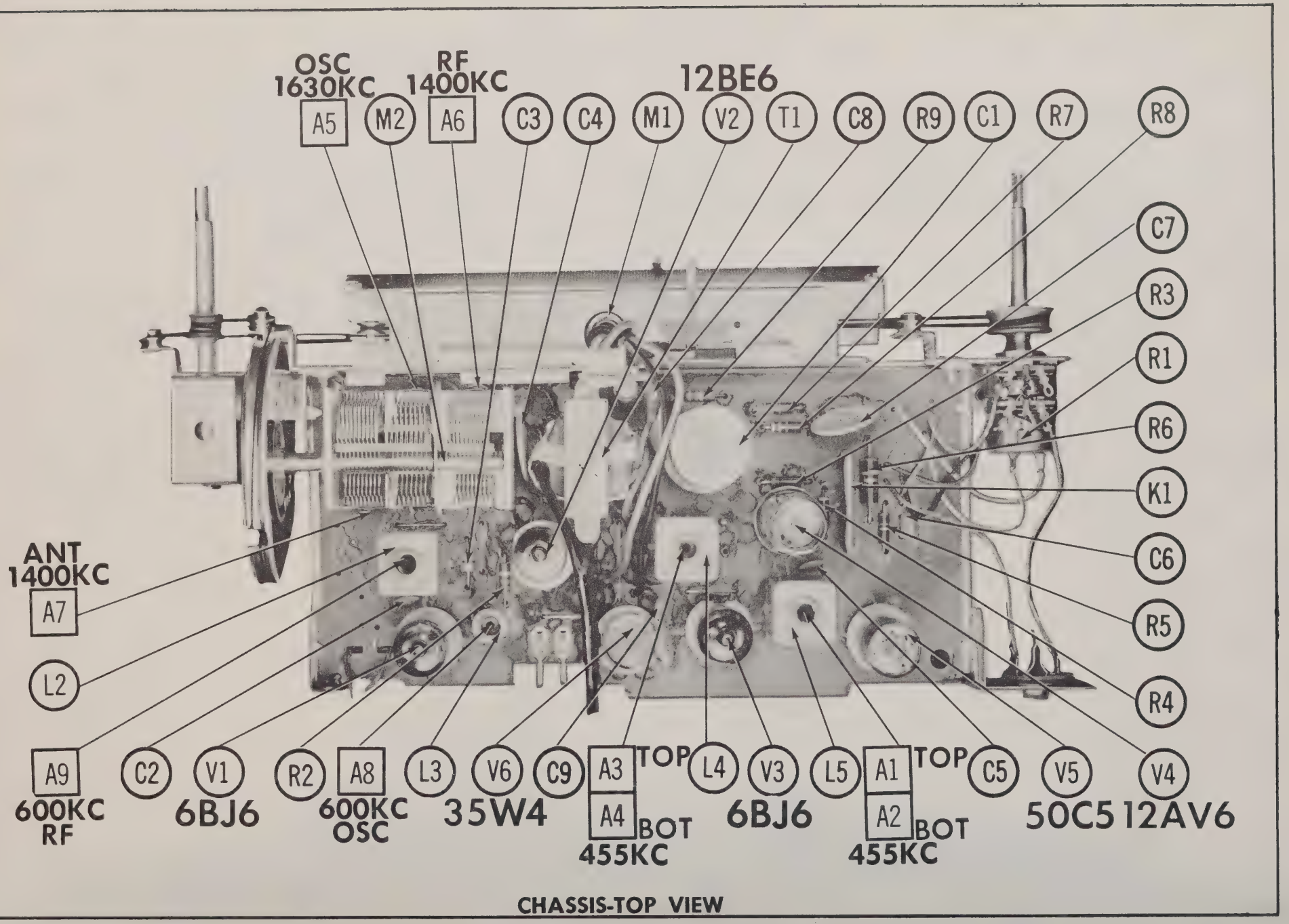


CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6BJ6	
V2	Converter	12BE6	
V3	IF Amplifier	6BJ6	
V4	Det. -AVC-AF Amplifier	12AV6	
V5	Output	50C5	
V6	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Silvertone PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■50	150	43711-3	AFH3-09	CO080	FP311.55	TMD-12	T-040	R2337 *
B	20	150					TD-20-150		
C	▲30	150							

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Silvertone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	100		43957-1		TCL-100					
C3	2.2		20238-4	NP0-SI 2.2	TCZ-2R2	Z006	TCO-2.2		5TCCB-V22	
C4	20000		43674-2	BPD-02	DD-203	K085	ED-.02		5HK-S2	
C5	150		43957-2	BPD-00015	DD-151	G046	ED-150	UC-5315	5GA-T15	
C6	2000		43674-4	BPD-002	DD-202	K072	ED-002	DC-522	5HK-D2	
C7	15000		43674-3	BPD-015	DF-153		ED-015		5HK-S15	
C8	20000		43674-2	BPD-02	DD-203	K085	ED-02		5HK-S2	
C9	20000		43674-2	BPD-02	DD-203	K085	ED-02		5HK-S2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Silvertone PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	1/2	43832	F1-52			UF16A	Tone
B	500K	1/2		R2-41			UR55A	Volume
C	Switch			KB-1			US-26	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Silvertone PART No.	IRC PART No.	
R2	22K		43687-223	BTS-22K	
R3	1Meg		43687-105	BTS-1Meg	
R4	47K		43687-473	BTS-47K	
R5	100Ω		43689-101	BTS-100	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Silvertone PART No.	IRC PART No.	
R6	12K	1	43688-123	BTA-12K	
R7	330Ω		43687-331	BTS-330	
R8	330Ω		43687-331	BTS-330	
R9	330K		43687-334	BTS-330K	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Silvertone PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.9K	3-4Ω	42700-13	Z1004 ①	A-3025	A-3332	26S58 ①	S-12X	① Fabricate mounting.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Silvertone PART No.	QUAM PART No.	
SP1	5"	PM	6Ω	43365-2	5A1Z6	
SP2	5"	PM	6Ω	43365-2	5A1Z6	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		Silvertone PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	43831-1				Includes cabinet back
L2	RF Coil	43829-1				
L3	Osc. Coil	43644-3				
L4	Input IF	43669-1		BC-356	13-PC1	
L5	Output IF	43669-1		BC-357	13-PC2	

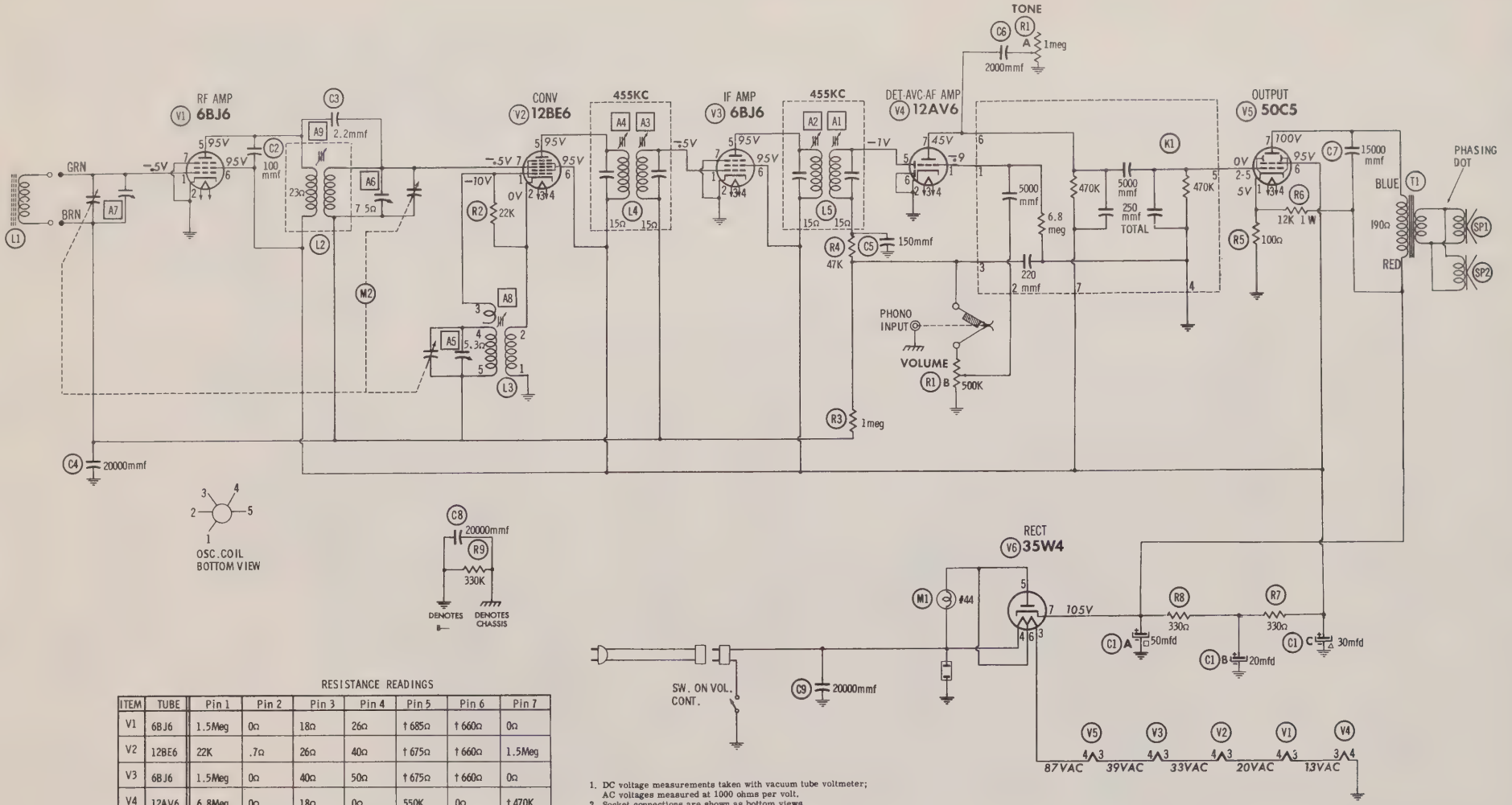
COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Silvertone PART No.	REPLACEMENT DATA	
K1	Detector-Audio Network	220MMF 6.8Meg 5000MMF 470K 5000MMF 470K 125MMF 125MMF	43743-2	Aerovox Centralab Sprague	PA-512 PCT-158 DT-5

MISCELLANEOUS

ITEM No.	PART NAME	Silvertone PART No.	NOTES
M1	Dial Light	23767	#44
M2	Tuning Cap.	43827	3 Gang
	Cabinet	44059-48	Brown
	Cabinet	44059-17	Ivory
	Knob	43931-48	Control front, brown
	Knob	43932-48	Control rear, brown
	Knob	43931-17	Control front, ivory
	Knob	43932-17	Control rear, ivory
	Crystal	43914	Dial
	Pointer	44177	Dial
	Pointer	44178	Tone

SILVERTONE MODEL 7013 (Ch. 132, 40100)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	6BJ6	1.5Meg	0Ω	18Ω	26Ω	†685Ω	†660Ω	0Ω
V2	12BE6	22K	.7Ω	26Ω	40Ω	†675Ω	†660Ω	1.5Meg
V3	6BJ6	1.5Meg	0Ω	40Ω	50Ω	†675Ω	†660Ω	0Ω
V4	12AV6	6.8Meg	0Ω	18Ω	0Ω	550K	0Ω	†470K
V5	50C5	100Ω	470K	50Ω	90Ω	470K	†660Ω	†190Ω
V6	35W4	NC	TP	90Ω	150Ω	140Ω	140Ω	40K

† MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION.
TP TIE POINT.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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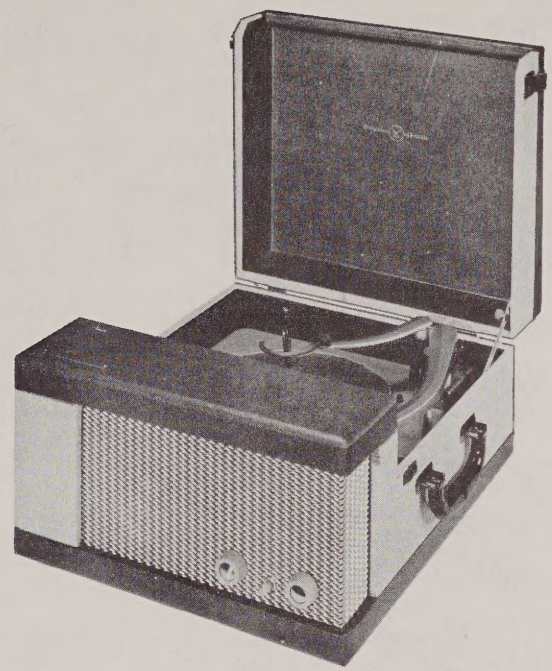
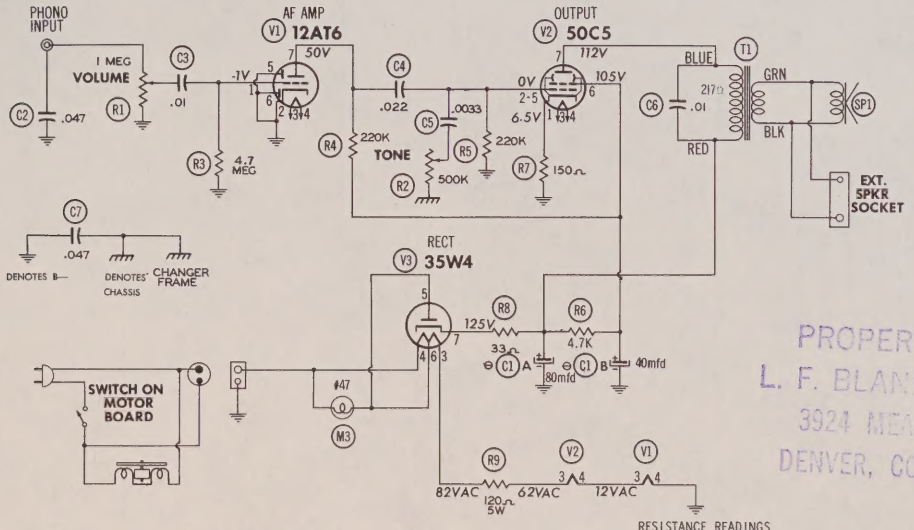


V-M
MODEL 1275

TRADE NAME	V-M Model 1275
MANUFACTURER	V-M Corp., Benton Harbor, Mich.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Three)	Types 12AT6 AF Amplifier, 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .16 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT - V-M MODEL 1200 - SEE PHOTOFACT SET #290 - FOLDER 11



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AT6	4.7Meg	0Ω	12Ω	0Ω	0Ω	0Ω	†224K
V2	50C5	150Ω	220K	62Ω	12Ω	220K	†4700Ω	†250Ω
V3	35W4	NC	TP	182Ω	217Ω	210Ω	210Ω	20K

† MEASURED FROM PIN 7 OF V3.
NC NO CONNECTION.
TP TIE POINT.

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AT6	
V2	Output	50C5	
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	V-M PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	(Note 1)	PRS150V4080	BBRD8415	FP216	TML-6	FMT-1540	TVA-3451
B	40	150	(Note 1)						

Note 1. Some versions may use an 80-50MFD unit in this application (part #12025).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	V-M PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.047	400	12009	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C3	.01	400	12003	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C4	.022	400	12026	BPD-02	DD-203	CUB4S22	817-02	PT4122	4TM-S22	
C5	.0033	600	12004	SI3300	D6-332	CUB6D33	GP2-333-332	PT6233	6TM-D33	
C6	.01	400	12003	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C7	.047	400	12009	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	V-M PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	11993	AB-70				Volume
B	Shaft		Not Req.	AK-4				Attach to R1A
R2A	500K	½	11988	AB-60				Tone
B	Shaft		Not Req.	AK-4				Attach to R2A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	V-M PART No.	IRC PART No.	NOTES
R3	4.7Meg		11613	BTS-4.7Meg	
R4	220K		11293	BTS-220K	
R5	220K		11293	BTS-220K	
R6	4700Ω		10893	BTS-4700	
R7	150Ω		10533	BTS-150	
R8	33Ω		10373	BTS-33	
R9	120Ω	5	11953	1 3/4A-125	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	V-M PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2400Ω	3.3Ω		Z1101	A-3025	A-3332	26S58 ①	S-12X	① Drill one new mounting hole.

SPEAKER

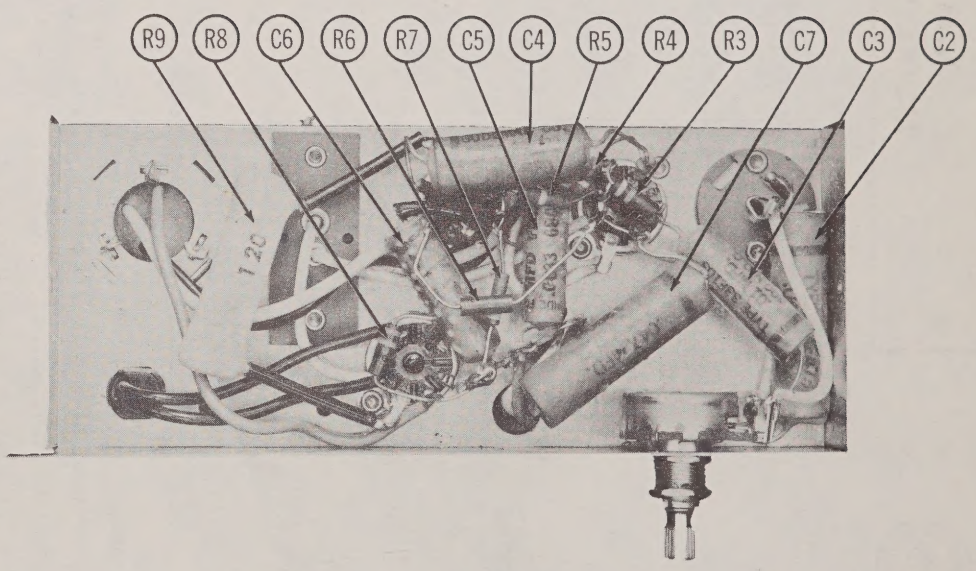
ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	V-M PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	5" x 7"	PM	3.3Ω		57A1	257S1	

PHONO CARTRIDGE

ITEM No.	V-M PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M1	7477	55-T	GD-J	56	PT-2	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

CHASSIS—BOTTOM VIEW



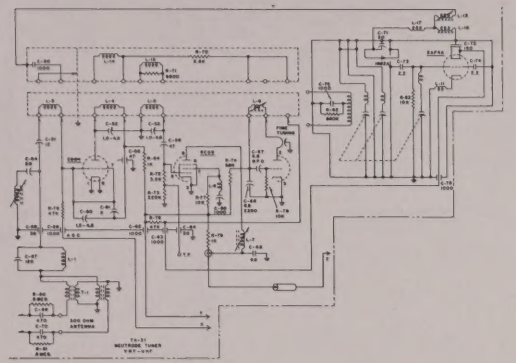
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	V-M PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2		*S-67 or †S-66 or ♦†S-66SD or ♦S-66D	†W-75TPS or †♦W-75DS or ♦W-75TPD	* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	V-M PART No.	NOTES
M3	Pilot Light	4654	#47

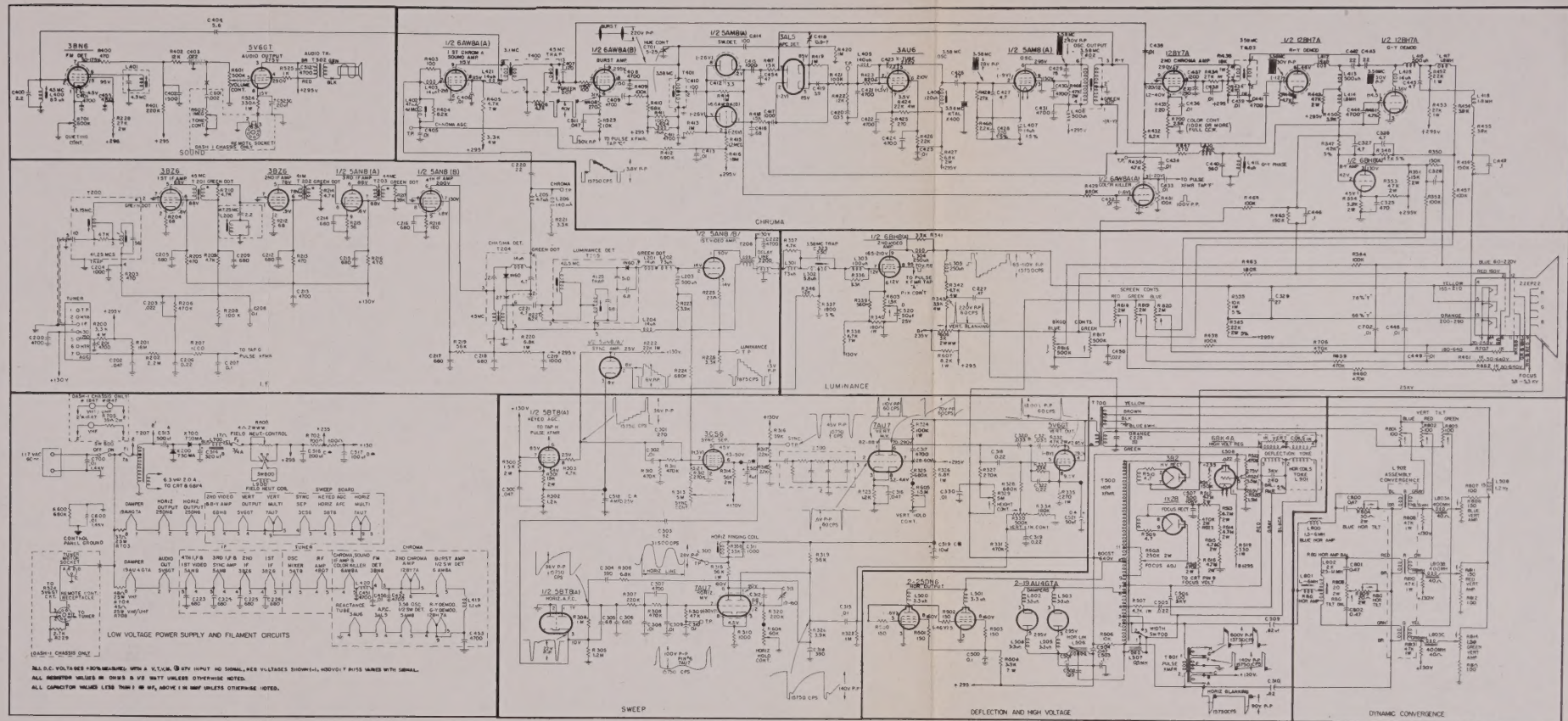


TRAV-LER MODELS	CHASSIS
621-740	632-26
621-740U	631-26
621-750	632-26
621-750U	631-26
721-R400	632-26
721-R400U	631-26

SCHEMATIC COURTESY OF TRAV-LER RADIO CORPORTATION

WESTINGHOUSE

MODELS	CHASSIS
H22T155	V-2293
H22T156	V-2293
H22T157A	V-2293
H22TU155	V-2294
H22TU156	V-2294



SCHEMATIC COURTESY OF WESTINGHOUSE ELECTRIC CORPORTATION

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